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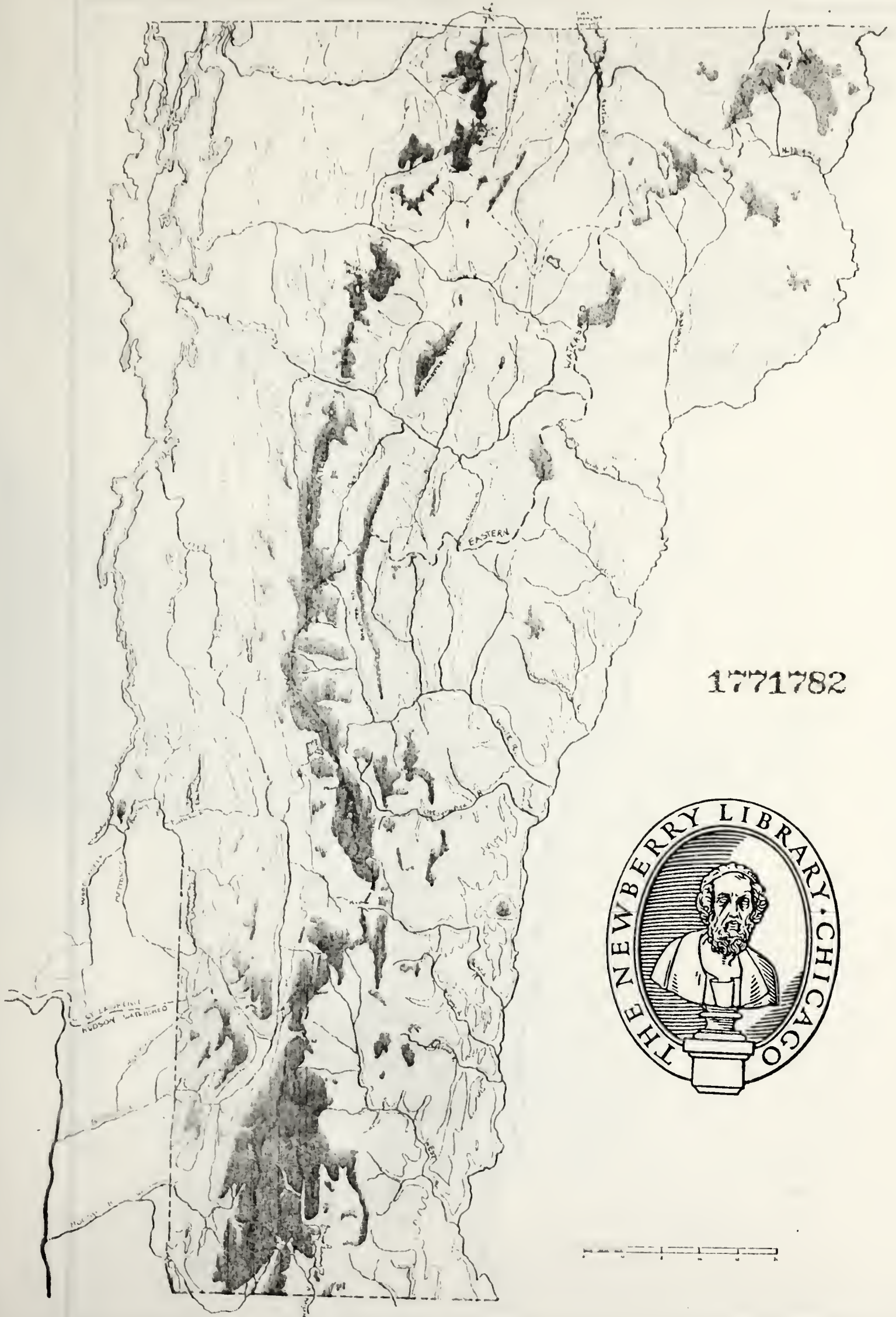
THE ROLE OF
TRANSPORTATION
IN THE DEVELOPMENT OF
^{Vt.}
VERMONT

BY
WILLIAM J. WILGUS

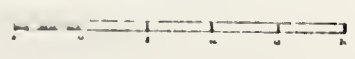
MAPS BY
EARLE WILLIAMS NEWTON
AND THE AUTHOR

MONTPELIER
VERMONT HISTORICAL SOCIETY

1945



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~ FIG. 1 ~

MAP SHOWING THE RELATION

~ OF ~

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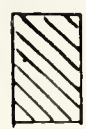
~ TO THE ~

MISSISSIPPI RIVER, ~

~ AND ~

GREAT LAKES-ST. LAWRENCE

~ RIVER BASINS ~



Mississippi River Basin



Great Lakes, and St. Lawrence River Basins.

Wilgus, William John, 1865-
The role of transportation in the development of Vermont,
by William J. Wilgus; maps by Earle Williams Newton and
the author. Montpelier, Vermont historical society, 1945.

104 p. incl. front. maps (part fold., 1 in pocket) diagr. 28 x 22^{cm}.

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PREFACE

THE Vermont Historical Society is proud to present this significant study by a distinguished railroader. Colonel William J. Wilgus has had a long career as railroad executive and engineer. His most famous achievement was the creation of the Grand Central Terminal in New York City, through which most every consumer of transportation has passed at one time or another. No less significant was the superb job which he did organizing the railroads of France for the reception and delivery of supplies for the American Expeditionary Forces in 1917-1919. His organizing genius is again at work in this war, in a manner not yet public. He is the author of several railroad and transportation studies which have become authorities in their field; among the most recent is his *Railway Interrelations of the United States and Canada*.

It was therefore logical that the Editor of the Society should turn to Colonel Wilgus for a study of the role of transportation in the growth of the state. For, excepting only the land itself, nothing has had a greater determining influence than transportation—from the time when the river valleys shaped the course of settlement, to the era when the railroad, by reaching or by-passing certain towns, passed a life or death sentence on their future. Yet no careful study had ever been made of this crucial aspect of the state's history.

Colonel Wilgus has not attempted a full scale history of transportation in the state. His brief essay is frankly a study of the *role* which transportation has played in the shaping of Vermont. Yet every sentence is full of meat for the student of economics and history, and the maps compress on a single page, in visual form, information which would take many lines of text to set forth.

It has been thought worthwhile to devote extensive attention to the development of illustrative maps for the study. It is practically impossible to visualize the growth of the railroad system, for instance, merely from a narration of the terminals which the expanding network achieved in any certain year. Furthermore, the extensive consideration which the author has given to the geography and economic life of the state has called for maps illustrating the determining influence which these had upon transportation growth. I should like to take this opportunity to thank the author for the helpful sketches which made clear the nature of the maps which would be needed. Several of these were re-drawn almost exactly as sketched. Acknowledgment should also be made to Mr. Lloyd T. Hayward, to the State Planning Board and to the State Department of Highways for invaluable assistance.

EARLE WILLIAMS NEWTON, *Editor*.

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FOREWORD

THIS study has been prepared in the hope that it may prove helpful to an understanding of the influential part played by transportation in the colorful history of the Green Mountain State. Much has been recorded of past happenings in each of the five transport agencies devoted to a common purpose, but little or none dealing with the subject as a whole. After all, that which has affected any one of them has had its bearing on the others. Separately and collectively they gave birth to events in history or were influenced by them. An interpretation of their effects and causes has in this been considered to be of moment. Hence the mode of treatment set forth in what follows.

For a full understanding it has been thought wise, first, to view the state's relation to the remainder of the country, its resources and physical characteristics, its trials and tribulations arising from external influences and rival claimants, and finally the conditions which have brought about the letting up in its growth of population. Then the various types of movement are taken up in their order—primitive transport, steamboats, turnpikes and canals, railroads in the making and 20th Century transportation, ever giving weight to their interdependence and co-relationship. The resume concludes a recital which, of course, will be recognized as merely a skeleton or framework intended to assist those who may care to go into the subject more deeply.

To the authors mentioned in the bibliography the writer owes his gratitude for the data on which in large part he has relied, as he does to state officials including the Commissioner of Highways, Mr. Hubert E. Sargent, the State Librarian, Mr. Harrison J. Conant, and the Commissioner of Agriculture, Mr. Edward H. Jones, as well as officers of the various railroads, all of whom have been most generous with information. There are others, too, in different fields who have been more than helpful. In particular he wishes to thank Mr. Earle Williams Newton, Director and Editor of the Vermont Historical Society, and his assistant Miss Agnes K. Lawson, for their assistance given without stint; also Mrs. Frank L. Abbott who has deciphered and typed his manuscript with skill and Gertrude Bernadette Wilgus, his wife, whose encouragement and counsel have been with him to the end.

WILLIAM J. WILGUS.



Fig. 2
RIVERS AND WATERSHEDS

PHYSIOGRAPHY

Alone among the six New England states Vermont is without direct access to the sea. Its mountain barriers still further emphasize its isolation. On the west for a hundred miles the cone-like lofty Adirondacks in New York bar the way in that direction; on the east the White Mountains of New Hampshire and their trailing foothills hinder intercommunication with the industrialized North Atlantic ports; and on the south the Berkshires of Massachusetts, including the Hoosac and Taconic Ranges, make the going difficult. On the north the region's access to the outside world is untrammelled by nature's obstacles, but the adjoining foreign territory puts a check on unfettered contact with the deep-draft St. Lawrence River channel for ocean carriers only fifty miles away.

Vermont's saving grace, from the standpoint of transportation, is its possession of north-and-south lines of least resistance along its eastern and western borders. On the west is Lake Champlain¹ nestled for 112 miles between the Adirondacks and Green Mountains, with its Richelieu River lower outlet flowing northerly for 80 miles into the St. Lawrence River, and its Wood Creek inlet rising at the source of waters leading south to the head of ocean navigation in the Hudson River at Albany and Troy. All this constitutes a remarkable 264-mile cut-off—of great potentiality for transportation between the St. Lawrence and Hudson Rivers—on which Vermont has the good fortune to abut for a hundred miles. Corresponding to this, on the eastern border of the state, is the south-bound Connecticut River,² once the active scene of boating in early days and since providing an easy course along its banks for land means of transportation.

It was because of the absence of natural barriers in what was in time to be the northerly boundary of Vermont, stretching from the foot of Lake Champlain east-

¹In the United States the lake's length is 112 miles by 9 miles wide at its broadest point, narrowing in its southern 37-mile arm, known as the Narrows, to widths varying from a few hundred feet to a mile. Depths are as great as 300 feet or more, with a minimum for navigation measuring 12 feet at controlling points; the mean low water surface elevation above sea level is 95 feet. In Canada its area in square miles is 17 and in the United States 419, a total of 436. (40)

²From its source at the northern tip of New Hampshire the river's fall is 1589 feet in its length of some 360 miles to Long Island Sound. Its width increases from 130± feet at the international boundary to 780± feet at the Massachusetts line, the western low water mark in this distance of upward of 206± miles constituting Vermont's eastern border. The elevation of the river above sea level at the former point is approximately 1060 feet, and at the latter 232 feet, these data being of use in determining the height to be surmounted at the crest of the Height of Land. (*Bibl. Ref.* 15, 34, 35, 47).

erly to the Connecticut River, that its soil was early adopted as a passageway for Indians and white men between New France, later to become Canada, and the British Colonies destined to become the United States. With the coming of nationhood on both sides of the international boundary the portals there took on increasing importance in the movement of "bridge traffic" between the American West and Canada and the warm water ports of Portland, Boston, Providence, New London and New York.

A glance at the map (frontisp.) makes this clearly evident. Eager rivalry for the growing trade of the vast interior of the continent,³ between the Mississippi River basin's southerly outlet to the Gulf of Mexico at New Orleans, the Red River northerly outlet leading to Hudson Bay, and the Great Lakes basin's northeasterly outlets to the Upper Atlantic, eventually gave to the latter a predominance in the struggle for the trade of all three basins, in which the St. Lawrence and Hudson Rivers, coupled with laborious land crossings of the Appalachian Range, played leading parts. It was a battle between Titans in which New England and Canada, lying as they did at the mercy of New York with its control of the water-level route through the gap between the Catskills and Adirondacks to the sea, looked for relief in some degree by means of circuitous routes north of the Adirondacks through the Vermont gateways east of Lake Champlain.

Vermont thus is to be viewed as the key-stone—a pivotal point—in the northern arch of transportation connecting the continent's interior with New England, and incidentally with the port of New York, as a governing influence in the weaving of the two countries' freight rate fabric.

The internal structure of Vermont⁴ is next to be given thought, affecting as it has the state's historic past for upward of three hundred years. As will be seen from the map (page 12), it is "literally a land of little rivers" of which the valleys have ever offered lines of least resistance for all types of transportation seeking low points of crossing of the various divides.

In this the outstanding feature is the richly verdured Green Mountains backbone bearing slightly to the east of north from the southwestern corner of the state on the Massachusetts line in the town of Pownal to a mid-point in the international border in the town of Jay, unbroken except for two deep openings through which the Winooski and Lamoille Rivers flow. There is also the Height of Land that

³Embracing some 1,250,000 square miles in the Mississippi River basin, some 525,000 square miles in the Great Lakes and St. Lawrence River basin, and upward of 1,486,000 square miles in the Hudson Bay basin, a total of say $3\frac{1}{4}$ million square miles or approximately a half of the entire area of the United States and Canada. (8,88).

⁴Measuring as the crow flies 154.2 miles in length north and south, the state is 91.4 miles wide along its northern border and 40.9 miles along its southern boundary, an average of 62.3 miles. The area comprises 9609 square miles of which 9278 are land. In size Vermont among the 48 states ranks 42nd. (15, 93) Authorities differ on the northern width, 88, 89 and 93 miles sometimes being given.

diverges from the Green Mountain range in the town of Granville, slightly more than half way in their northerly course, and runs easterly and northeasterly quite close to the Connecticut River to the Canadian line in the town of Canaan. Diverging, too, from the Green Mountains is the divide extending from Mt. Tabor westerly through the towns of Peru, Dorset and Rupert to the New York state line. Added to these are the Hoosac Range in the towns of Stamford and Readsboro, the Taconic Range along the southwestern side of the state, and the Braintree, Northfield and Worcester Mountains extending in tandem immediately east of and parallel to the Green Mountains all the way from the White River to the Lamoille.

These governing watersheds divide the state into three parts—the Hudson River basin draining westward into New York State through three openings in the Taconic Range; the Connecticut River basin in which twelve rivers of note thread their way in a southeasterly and southerly direction fostering traffic movements between the northern border gateways and the sea; and the St. Lawrence River basin, embracing the territory north of the Hudson River basin and west of the Height of Land, where the waters are gathered together in ten notable rivers of which three flowing northerly empty into Lake Memphremagog and seven in a northerly and westerly direction into Lake Champlain. Contrary to a popular understanding, the St. Lawrence River basin is by far the largest of the three, its area and that of the Hudson River basin constituting 60 per cent of the total for the state, while that of the Connecticut River basin embraces but 40 per cent.

It is to be observed therefore, that twenty-five swiftly falling rivers of special import criss-cross the state, of which many are marked by noteworthy features of scenic charm and usefulness. The long north-and-south trough between the Taconic and Green Mountain Ranges, known as the West Vermont Valley, has been of inestimable value in the development of the state, as have the famous breaks in the Height of Land known as the Granville, Northfield or Brookfield and Williamstown Gulfs, where the sources of three branches of the White River flowing south and southeasterly into the Connecticut adjoin those of an equal number of tributaries of the Winooski River flowing north and then northwesterly through the gap in the Green Mountains into Lake Champlain. Between the Green and Worcester Mountains, too, lies a valley of commanding interest.

A description of Vermont's topography would be incomplete were not mention made of the characteristics of the Green Mountains and of their divergent Height of Land, the surmounting of which has been inescapable in the development of the state, whether for local interchanges between the basins or for interrelations with the outside world. In its length of more than two hundred miles within the state, the Green Mountains number some 58 peaks ranging from 3000 to 4393 feet in altitude above the sea, an average somewhat in excess of 3500 feet. Between them, at eleven crossings, there are passes varying in highway altitude from the lowest, 1330 feet, in the town of Eden to the highest, 2389 feet, in the town of Woodford.

Generally speaking their altitude may be said to be of the order of 2000 feet, other than where the Winooski and Lamoille Rivers burst through the mountains at elevations only a quarter of that figure. (15)

The Height of Land beyond the "Gulfs" is in general unmarked by peaks, and its lateral slopes are much more gentle than those of the main range of which it is an off-shoot. Its highway summit crossings number fifteen, with altitudes above sea-level varying from a minimum of 920 feet in the Williamstown Gulf to a maximum of 1940 feet in the town of Walden. The gaps in the Taconic and Hoosac Ranges make the climbing there less difficult. (15)

On the whole it is to be said that Vermont is a most difficult state to traverse, both as to internal movements from place to place and as to extensions outward toward the sea in one direction and the interior of the continent in the other. For the rare beauty with which it is so well endowed the state has had to pay the heavy price of isolation thus enforced by its physical characteristics. This obviously is to be borne in mind in studying the part played by transportation in its social and material upbuilding since the coming of Champlain.

Bibliographical References: Nos. 8, 15, 17, 34, 35, 40, 47, 63, 76, 88, 93.

II

RESOURCES

WHEN the region now named Vermont first came within his range of vision from the top of Mount Royal in 1535, Jacques Cartier could not have dreamed of it as a land rich in trade, gold, precious stones and romance, as had Columbus, Cortez and Pizarro of the Spanish Main. Its distant azure sky line held beauty but the world's imagination did not invest it with a promise of great material gain. So he sailed away to be followed seventy-four years later by Samuel de Champlain who viewed its lofty mountains from the lake that bears his name and discovered it to be a wilderness, withal beautiful, sparsely peopled by warring nomads and possessed of stately forests, swift, sparkling rivers and abundant fish and game. In the usual sense it offered no hope of profitable exploitation. Mineral resources, if any there were, lay hidden from sight; the rugged terrain to be made fruitful called for painful labor; and the unsurmountable difficulties of transportation by primitive means to far-off markets barred the disposal of surplus products.

One feature, however, was shortly found to give to the region a strategic value of outstanding importance, namely, its comparatively easy means of communication between New York, New England and New France. By Indian trail, lake and stream, ways were thus open for explorers, missionaries, hunters, traders, occasional settlers here and there, and bands of warriors in constant conflict.

For a century and a half after Champlain's coming these rude conditions continued amidst ever present danger until the fall of Quebec in 1759 brought peace and the opening of the region to settlement by the British colonists. The time at last was ripe for the development of its resources 224 years after the coming of Jacques Cartier. The long sleeping beauty was about to be awakened.

The pioneers in this new movement *en masse* faced a fearsome task. Widely separated little forest clearings made by them required widening; and pot and pearl ashes made from the fallen hardwoods were painfully carried to distant points where they could be sold for cash, or bartered for a few necessities carried in at great expense from the outside world. Food was gleaned from garden patches and forest and stream, as were materials for making furniture, tools and clothing. It was a way of life for the settlers—one of self-sufficiency—as the difficulties of transportation held them as in a vise.

With the passage of years came the building of rough, narrow roads for inter-communication and for access to navigable lakes and streams, and with them came scattered grist mills, cider mills, saw mills, paper mills, woolen mills and tanneries

driven by small water powers to supply local needs; also little villages with stores, churches, blacksmith shops, and artisans practicing a few trades such as shoe-making in which specialization was found to be preferable to home work. Lumbering too, took on a growing importance through the use of streams for floating logs and lumber, as well as their finished products, to and through Lake Champlain via Burlington in rafts to Quebec for the English market; also to the Connecticut River for rafting to Springfield and Hartford and beyond. Out of these activities came an enormous trade in this product, until the ruthless exhaustion of the state's available forests in the 1840's forced the importation of Canadian timber for the continuance of the process of manufacture built up from the home product at Burlington and elsewhere. Both water and rail transportation made this possible as the years went on.

It was not alone in lumbering that the resources of Vermont took on stature. The clearing away of forests yielded agricultural land from which grains and live stock and their products were sent to market by improved means of transportation; from forests, spared the lumberman's axe, fuel was drawn; and the humble ginseng was exchanged for tea and other luxuries from China after the opening of trade with that country in 1784-85. The coming of the first merino sheep in 1810-11 gave rise to the need for expanded grazing areas on which the number of sheep reached the astonishing figure of 1,681,819 in 1840, soon followed by a steady steep decline as will be seen on Fig. 4. The causes for this reversal, among others, were western competition fostered by free grazing lands and cheap long-haul freight rates, the lowered tariff on wool, and depredations of wild animals and dogs. The shift that had been made from the growing of grains and the raising of beef cattle and swine to sheep culture, thus changing the state in large part from an exporter to an importer of feed, and lessening opportunities for farm employment, is reported to have given to the state a body blow—as indicated by the falling off in the rate of growth of its population after 1830.

Whether or not this is a correct conclusion, it was to offset the loss of its pre-eminence in sheep culture that the eyes of the state were turned to dairy farming. As will be seen on Fig. 4, the number of dairy cows increased markedly after 1850 to 1920; since then the growth has been stationary or on the decline. In the beginning the making of butter and cheese was an important element in this, but in recent decades the shipping of fluid milk has taken its place.

In brief it is to be said that in agriculture, and its allied industries, Vermont has passed through the successive phases of self-sufficiency, diversified farming and lumbering, sheep grazing and dairying. It has been said that its happiest time, with its ups and downs, was in the 25-year period of diversification lasting from the close of the Revolutionary War in 1783 to the enforcement of the Embargo Act in 1808. The man power, soil and forests were in their prime, wild game and fish in abundance were at beck and call, crude means of transportation in New England

were on the mend, destructive competition with the West had not yet raised its head, the independence of self-sufficiency in a measure still survived, the lure of the distant factory was yet to come to separate families, and Europe made upon the country urgent calls for badly needed food and raiment.

The mineral resources of Vermont, shown in outline on page 21, lay fallow in large part until the latter half and even the closing quarter of the 19th century. The coming of railroad transportation gradually made possible the large scale development of the remarkably fine deposits of marble and slate centering at Rutland on the western side of the Green Mountains; of granite ledges of the highest quality centering at Barre in the north-central region west of the Height of Land; of copper ore mines in the Connecticut River valley doomed to a checkered career and of late brought to life again for the war's duration; of asbestos of a rare quality in the northern part of the state; and of limestone, talc and soapstone at several places. Iron ore was found widely scattered and worked for local needs from early days until this industry was brought to a close by the high cost of coal in substitution for locally made charcoal in the manufacture of pig in the 1840's, and by the costliness of transportation by crude means over hilly roads for delivery to rail and water carriers at distant points.

Manufacturing in the state commenced, as has been told, at the various small mills built to supply the simple needs of the early settlers. Then followed forges and iron works, of which there is the instance of Ethan Allen's about 1789; lumber and woodworking industries, in particular at Burlington and Newport; marble and granite works in the vicinity of Rutland and Barre, respectively; factories for the making of screens, organs and knitwear at Winooski, Brattleboro and Bennington, respectively; machine tools at Windsor and Springfield; and scales at Rutland and St. Johnsbury. Textile mills, too, came increasingly into being at scattered places, and facilities for the manufacture and packaging of maple sugar and syrup, for many years Vermont's most famous products.

In this development of institutions for manufacture, the power for their operation was derived from the state's many little rivers. The larger hydro-electric plants along the Connecticut River, and the impounded waters of the Deerfield River in the southern part of the state, have not helped much in this, as their output in the main has been sent to other regions.

As was to be expected, the industrial development of the state has resulted in a concentration of urban population at leading centers, fourteen in number, of which their relative importance as measured by population is illustrated in Figs. 3 and 4. In the St. Lawrence River basin will be found the principal ones, where the mineral resources are more plentiful. The Connecticut River valley in this respect has suffered.

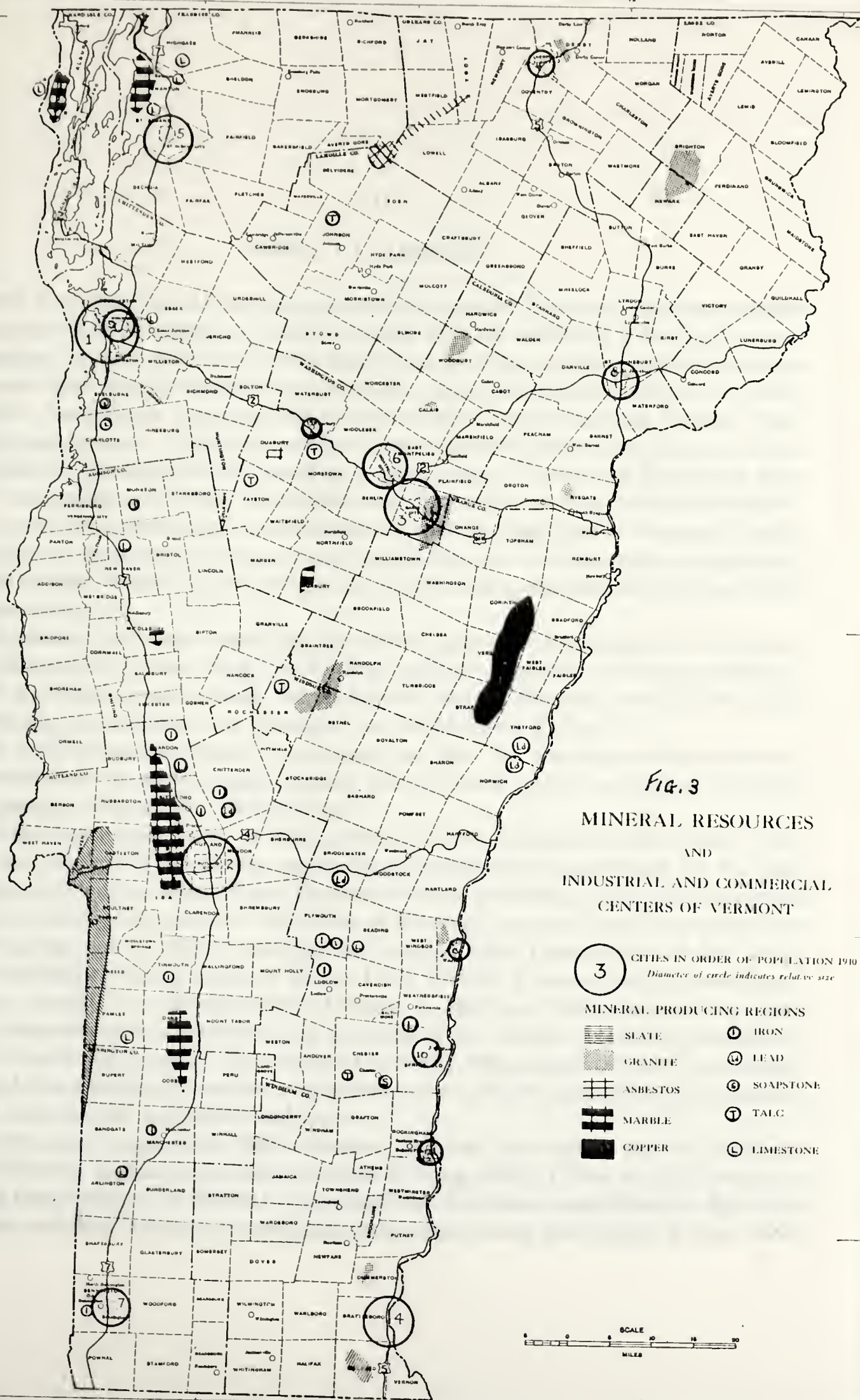
Mention in this recital has not been made of the presence in the state of oil and coal; nor of concentrated beds of easily worked staple minerals like iron and

copper in great quantity directly served by low-cost transportation; nor of adjoining deep water channels leading to the Great Lakes or sea, by means of which raw materials from the wide world may be brought in cheaply and the products made from them sent out. They simply do not exist to make of Vermont an industrial paradise!

There are, however, two of the state's possessions that shine forth with brilliance—the strategic position it occupies in pathways of transportation between New York, New England, Canada and the West; and its far-famed beauty made accessible by rail and highway and air to seekers of recreation and spiritual uplift. The former advantage has brought to the state small reward except that which comes from unselfish service yielded others; the latter has given to its citizens a sense of pride and some monetary return, together with the promise that the future protection and enhancement of its beauty will go far to keep to the state its young who for much more than a century have sought elsewhere for opportunities denied them at home.

Looking backward, it is to be said in all this that transportation has both given and taken away blessings, as will be dwelt upon in the chapters that follow.

Bibliographical References: Nos. 2, 13, 15, 17, 27, 32, 36, 44, 50, 54, 57, 59, 60, 61, 64-66, 71, 73, 89, 91, 94.



III

RIVAL CLAIMANTS

LONG a no-man's land lying between warring peoples, Vermont by various names stands high in history. As a rich source of food and furs, a hunting ground abounding in game and fish, it was fought for by Indian tribes—Algonquins and Iroquois—who sought control of its strategic routes for primitive travel, by canoe and trail, from the St. Lawrence River basin to the Connecticut and Hudson River valleys and beyond. With the coming of the white man in the early decades of the 17th century the struggle continued on a rising scale. French and English in their thirst for empire, and later the British and Americans during the Revolutionary War, found the travel ways to be essential to their success both in trade and battle. Rivalries for possession of the no-man's land also arose between the neighboring British colonies which looked with greedy eyes on the opportunities there presented for speculation.

Vermont, therefore—under its successive names of Iroquoisia, New France, New Hampshire Grants, New Connecticut, and the Republic of Vermont before it joined the Union—was in truth the cockpit of colonial America, much more a dark and bloody ground than was Kentucky or the Mohawk Valley.

A brief glance backward is necessary so that the reasons for this dramatic situation after the white man's coming may be made clear—a situation in which transportation played an influential part.

Almost simultaneously, in 1609, Champlain in furtherance of the claims of his sovereign, Henry IV of France, extended his explorations southward on the lake that bears his name, while Henry Hudson sailed northward on the river that bears his name and laid grounds for the claim of his employer, the Dutch, to suzerainty as far as the site of Albany and beyond toward Lake Champlain. A few years later the English, in the reigns of James I and Charles I, made their Plymouth and Puritan landings in Massachusetts Colony in 1620 and 1630, respectively, and spread westerly and northerly in the direction of the regions previously penetrated by the Dutch and French. The Vermont territory, situated as it was at the meeting point of these three approaches, was bound to be a battle ground for the whites as it had been for the prehistoric red man.

For eighty years after 1609, however, this land was left in peaceful solitude other than for Indian forays such as those of King Philip's War in 1675-76 and of roving bands ever to be feared. Occasional small military expeditions to fight the Indians, and lone hunters, traders and brave missionaries like Father Jogues, were

the only whites to venture there. A fort was erected by the French on Isle La Motte in or before 1666 to command the outlet of Lake Champlain. Far to the south the Dutch domain had fallen to the English in 1664 and was then handed over to the Duke of York by his brother Charles II, with other territory, to include the Vermont country south of a line extending southwesterly from the source of the Connecticut River to a point on Lake Champlain. A previous grant had been made in 1629 by the Council for New England to Captain John Mason, named by him New Hampshire, extending westerly to Lake Champlain and placed under the protection of Massachusetts in 1641. As early as 1683 the British were disputing the jurisdiction of France over the territory south of the St. Lawrence River, on the ground that it had been acquired by the province of New York through a treaty with the Iroquois. During the latter quarter of the 80-year period, therefore, the Vermont country was claimed in whole or part by New York, New Hampshire and Massachusetts under British rule, and by New France under French rule, with overlappings promotive of discord.

Then came King William's War between the British and French, lasting from 1689 to 1697, during which Lake Champlain and the Connecticut River, with their connecting Indian trails and waterways, became thoroughfares for attack and counter-attack. It was in this conflict that the British in 1690 established a trading post and fort on the east bank of Lake Champlain where it narrows at the site of Chimney Point, as a check on the one that the French had built in 1666 on Isle La Motte. After a short interval came Queen Anne's War to last from 1702 to 1713, marked in 1704 by the attack on Deerfield, Massachusetts, and points beyond by French and Indians moving on Lake Champlain and the Winooski and Connecticut Rivers. The conclusion of peace at Utrecht resulted in the fixing of an ill-defined boundary between Massachusetts and New France about where the northern line of the counties of Bennington and Windham, Vermont, now run.

Ten years of comparative peace ensued when Father Rale's War broke out lasting from 1723 to 1726, as a result of which Fort Dummer was built in 1724 by the province of Massachusetts, near the southeast corner of the present town of Brattleboro, to serve as a trading post and command movements to and fro on the Connecticut River.

During the next fourteen years of uneasy peace the French in 1730 erected a fort on what is believed to have been the abandoned site of the strong-point built by the British in 1690, and in the next year they completed Fort St. Frederic on the opposite side of the Narrows, at the site of what, through capture by the English in 1759, was to become known as Crown Point. In this fortification of a vital spot on Lake Champlain the stage was being set for the coming conflict, the senseless War of the Austrian Succession lasting in Europe from 1740 to 1748 and in America known as King George's War from 1744 to 1748, which had its tragic consequences without a resulting material change in the position of the claimants to the Vermont

country. Three southern forts had their part in this—Fort Dummer, Number Four on the Connecticut River at the site of Charlestown, N. H. (just below the mouth of the Black River in Vermont), and Fort Massachusetts at the lower end of the West Vermont Valley—in addition to those on Lake Champlain.

The suspension of hostilities between the contending peoples for a short six years' period was succeeded by the so-called French and Indian War, lasting from 1754 to 1763, also known in history as the Seven Years' War with its official start in Europe in 1756. It was bitterly fought along the Lake Champlain thoroughfare where Ticonderoga (known to the French as Fort Carillon) and Crown Point (Fort St. Frederic) were centers of conflict; and along the Connecticut River passageway at Number Four and Fort Dummer. With the victory of Wolfe on the Plains of Abraham at Quebec in 1759, and the fall of Montreal in the succeeding year, the empire of France passed into history and the Vermont no-man's land lying south of the 45th parallel ceased to be such when it came beneath the British flag in 1763. Its beauties, the fertility of its intervalles, and the richness of its forests had been brought to the appreciative eyes of the colonial soldiers who traversed the newly built Crown Point Road from Wentworth's Ferry on the Connecticut River, nearly opposite Number Four, to the shores of Lake Champlain, and who boated and rafted those waters from end to end. They carried back the news to their New York and New England homes and the emigration to what had been a land of forbidding mystery started. The sleeping beauty was awakened after the lapse of 150 years, during which the din of conflict had disturbed her dreams, first for 80 years when the Indian was the white man's foe; and then for the succeeding 70 years when white men from overseas with the aid of the Indian fought each other. Transportation in all this, though crude to the last degree, was the foundation on which all else rested.

Between 1740 and the outbreak of the Revolutionary War, and afterward, the over-lordship of the Vermont country was actively claimed by all three neighboring provinces, even when they became states. New Hampshire alleged its ownership as far west as Lake Champlain by reason of the Mason Grant of 1629 and the fixing of the Massachusetts-New York boundary by George II at a north-and-south line twenty miles east of the Hudson River, and its governor, Benning Wentworth, accordingly made grants of land beginning in 1749 to settlers west of the Connecticut River. New York in turn claimed that its jurisdiction north of Massachusetts extended east to the Connecticut River, based on the terms of the Charles II grant to the Duke of York in 1664 and affirmed a hundred years later by George III in 1764. Massachusetts, too, had certain claims to jurisdiction north of its east-and-west boundary line which had been determined by George II in 1740.

This disputed territory, termed New Hampshire Grants until 1777, and thereafter the Republic of Vermont until its admission to the Union, was the scene of bitter controversy between settlers holding their titles from the governor of New

Hampshire and the governing authorities in New York who sought their ejection. Moreover, the scope of the successor to New Hampshire Grants in 1777, the newly created New Connecticut shortly changed in name to the Republic of Vermont, was broadened on the east to include a strip of New Hampshire along the Connecticut River and on the west allegedly to embrace a part of northern New York beyond Lake Champlain, while an effort was even made literally to wipe the new republic off the map by fixing a division line between New Hampshire and New York at the crest of the Green Mountains. With the coming of statehood in 1791 Vermont geographically became the state it is today and responsibility for its means of transportation was then exclusively its own.

The War of Independence made of the land in question again a battlefield. Up and down Lake Champlain swept the armies and navies of the Americans and British, marked by the naval engagement at Valcour Island; the gain and loss and regaining of Ticonderoga and Crown Point commanding the passage of troops and their supplies at those vital points; the battles of Hubbardton and Bennington, and the decisive battle of the world at nearby Saratoga which settled the supremacy of the Americans on the route that bordered Vermont on the west. In these stirring times the eastern side of the state had its momentous part in the building of the Hazen Military Road from Newbury on the upper Connecticut River toward Lake Champlain and the Richelieu River in Canada, a project of great benefit to the pioneer settlers though not carried beyond the Green Mountains' crest. The old Crown Point Road of the French and Indian War continued to serve well its double purpose of opening the region to peaceful settlement and furnishing a thoroughfare for the American troops in times of crises.

The final admission of Vermont to statehood brought a close to the many rivalries for its control. The lines of communication so necessary for its development were open to the world and no longer endangered by internal conflict. The later war of 1812 did again threaten its freedom of intercourse on Lake Champlain, but that soon passed. Thought may now be turned to influences from without the state which deeply affected the nation's transportation as a whole, and in so doing had a notable part in molding the fortunes of Vermont.

Bibliographical References: Nos. 2, 3, 13, 14, 15, 24, 27, 32, 36, 47, 54, 59, 85, 88, 89, 91, 95.

IV

EXTERNAL INFLUENCES

IT has been well said that "the true history of the United States is the history of transportation," applicable alike to the Union as a whole and to its interrelated parts. A full knowledge of events in history is thus required in order that their causes and effects bearing on transportation may be thoroughly understood. An examination of the historical records of the newly launched ship of state, following the close of the Revolutionary War, is in this just as essential as an inspection of the log of a vessel on reaching port to learn of all the happenings on its cruise before arriving there. To confine a study of Vermont's transportation strictly within its borders would be inexcusably to ignore consideration of distant sources and destinations of traffic flowing into or through or around the state, and of political changes, wars, discoveries, inventions, shifting and growth of populations, legislation, overseas demands, and agricultural, mining, forestry and industrial expansion, all affecting the character, volume and direction of movement in which Vermont was destined by its location to play some part. It is to throw light on this broader situation that this brief chapter has been written.

At the beginning it should be noted that the War of Independence had been no sooner won than the clear vision of George Washington in 1784-85 pointed to the need for "the nearest and best communication between the eastern and western water . . . as a chain binding the peoples of the Mississippi to those of the Atlantic seaboard." A failure to pay heed to this admonition long threatened the loss to the Union of the territory beyond the Alleghenies, where the natural course to foreign markets was down the Ohio and Mississippi Rivers to and through the Spanish port of New Orleans to the Gulf of Mexico. It was at this time that the closing of the British West Indies to the new-born nation's shipping led to the opening of trade with China in American bottoms carrying among other things products indigenous to Vermont such as furs and ginseng. Moreover Europe, suffering from revolutions and recurring wars, was beckoning for foodstuffs in response to which the famous American clipper ship came into being.

The danger of a loss to the United States of the Mississippi Valley finally became so imminent, after a lapse of nearly twenty years, that the Louisiana Purchase was brought about by Jefferson in 1803, an event found to be none too early when Aaron Burr became involved in moves which if successful might have prevented the winning of the West. The acquirement, forty-five years later, of Mexico's possessions west of the Mississippi and north of the Rio Grande, as the outcome

of the Mexican War of 1846-48, gave to the United States the resources of the West in full, together with the command of its outlets in opposite directions to the Gulf of Mexico and the Atlantic seaboard.

Meantime a struggle of vast proportions had become increasingly intense for the carriage of the Mississippi Valley's products. For more than fifty years, after the Louisiana Purchase, the easy route down stream through New Orleans took precedence over more costly ones running eastward across the Allegheny divide. The coming of the steamboat, beginning in 1811, had removed one of the handicaps from which navigation there suffered. Gradually, however, the tide was made to turn the other way, as first the National Turnpike under federal auspices was built from connections with Philadelphia and Baltimore to Wheeling on the Ohio River in 1818; then the opening of the Erie Canal affording water communication from the port of New York across the wheat-growing Genesee Valley to the Great Lakes in 1825, followed by the completion of the Pennsylvania system of canals and portages over the Alleghenies and by several canals between Lakes Erie and Michigan and the Ohio and Mississippi Valleys; and finally the extension of the country's growing railroad network of main lines and branches from the Atlantic seaboard to the Ohio in 1852, to the Mississippi River in 1854, to the Missouri in 1859, to the threshold of the Northwest in 1862, and to the wheat fields of Kansas and thence to California in 1869. At the commencement of the Civil War traffic on the Mississippi River and its tributaries was at its crest. Thereafter the superiority of the railroad over river navigation, with its greater speeds and reliability and its non-interruption of service during winter months, had its reward in the reversal in direction of the major portion of the Mississippi Valley movements of grain and other agricultural products, and animals and their products, from south to east with the Great Lakes-St. Lawrence outlet in the fore.

Along with this battle for control of transportation in the West went the development of the Great Lakes basin with its treasures of iron and copper and other ores contiguous to coal, the tapping of which by the Erie Canal in 1825, shortly after the appearance of the first steamboat there in 1818, was followed by the building of competing lines of railroad in the East. The Western Railroad (now the Boston and Albany) was opened from Boston to Albany in 1841. Then came the chain of low-gradient railroads, afterward known as the New York Central, completed from Albany to Buffalo on Lake Erie in 1842, from Albany to the port of New York in 1851, and from Buffalo to Chicago by means of friendly connections along the south shore of Lake Erie in 1853 and on the north side of that lake in 1855. Over the Allegheny Mountains, in contrast with the New York Central's easy passage through the Mohawk River gap, the Erie Railroad arrived at Dunkirk on Lake Erie in 1851, and lines ultimately forming parts of the Pennsylvania, Baltimore and Ohio and Erie systems reached Chicago at various times between 1852 and 1874 and later.

In the third quarter of the 19th century, therefore, Chicago at the southern tip of Lake Michigan had become the focus of many railroads penetrating the West in all directions; leading eastward were four American trunk line groups with termini at the competing ports of Boston, New York, Philadelphia and Baltimore.

In water transportation on the Great Lakes the railroads had an ally instead of a contestant as they had on the Mississippi. The discovery and working of stupendous deposits of copper and iron ores in the Lake Michigan and Lake Superior regions starting in the 1840's and 1850's, added to the ever increasing grain crops stimulated by the invention of labor-saving farm machinery in those years, made demands for the low cost movement of bulk commodities as far east as the foot of Lake Erie and beyond. These demands were alone to be satisfied at the hands of deep-draft lake carriers of great capacity in cooperation with the railroads acting as feeders and distributors, and taking over the entire load when navigation was suspended in the winter months.

All of this tremendous development, attended as it has been by growth of population and the marriage of raw materials from the nation's interior with fuel from the southwest and from the mines of Pennsylvania, Ohio, Illinois and West Virginia, had its outcome in the creation of manufacturing enterprises on a gigantic scale in the Great Lakes and adjoining regions, dependent on rail and water outlets to the East. The rise of meat packing industries near the supply of live stock in the West, coupled with the invention of refrigeration in the 1870's, gave still more importance to the Great Lakes region as a treasure house eagerly served by the lines of communication which fought for the carriage of its products to Atlantic ports, themselves contesting for control of domestic markets and foreign trade.

The eyes of Canada were not closed to the opportunities offered them to partake in this movement eastward. Emulating the example set by the State of New York in its opening of the Erie Canal in 1825, the Canadians soon after initiated a system of canals around the falls of Niagara and rapids in the St. Lawrence River, in order that they might divert a share of American grain products northeastward to their seaport of Montreal. The Americans themselves fostered this, as the use of the Welland Canal by their vessels would open their ports on Lake Ontario and the St. Lawrence, in particular Ogdensburg, to Great Lakes water traffic, and also give them a chance of winning some of the Montreal business overland and by Lake Champlain to the New England states and New York.

The Canadians, though belatedly, also saw the need for rail transportation to supplement that by water closed in winter, and in 1853 step by step opened their Grand Trunk Railway system from Portland, Maine, westward through Montreal, reaching Toronto in 1856, Detroit—where connection was made with American lines—in 1860 and Chicago by rail in 1881, with branches either direct or through connections to ports on Lake Huron in 1854-55, to the Niagara Frontier in 1855, and ultimately to many other points in or reaching American territory, and to its

terminal on the Pacific in 1915. The completion of the Victoria bridge over the St. Lawrence River, at Montreal in 1860, further facilitated the interchange of traffic via the Vermont gateways with railroads in the United States.

In the creation of the Canadian Confederation in 1867—the making of a nation—transportation had the leading part, for without the building of the Canadian Pacific Railway, completed to the Pacific in 1885, that would not have been possible. The expansion of this system put it in touch with the American West and Great Lakes region and with the New England states via Vermont, thus adding another great group of feeders to the railroads on the American side of the border. Furthermore, the bringing together of the Grand Trunk and Canadian Northern Railway systems into the fold of the Canadian National Railways in 1918-23, made with the Canadian Pacific two mighty collectors of traffic on both sides of the international boundary from the Atlantic to the Pacific, with eastern entrances to the United States through Vermont.

In short, the opening of the Canadian routes, tapping the north interior of the continent in general, and the enormously productive Mississippi Valley and Great Lakes basin in particular, gave to the New England states and port of New York alternative so-called differential routes, withal circuitous, on which lower freight rates served as a check on charges made by the so-called standard roads—the New York Central, Pennsylvania, Erie and Baltimore and Ohio Railroads—devoted to interests believed to be divergent from those of Boston, Portland and other New England ports and their hinterlands. The bonding privilege, strengthened in 1845, whereby cars passing between points in either country over the soil of the other were sealed, as well as the adoption of other cooperative regulations by the legislative bodies of both countries, went far to facilitate this free interchange of traffic.

There are other events of a nation-wide nature that cast their light, or shadow, on the development of Vermont. The direct access of its sister New England states to the sea brought to their ports raw materials from all over the world for manufacture into finished products distributable to domestic and foreign markets. The building in their neighborhoods of factory towns began in earnest some years after the War of 1812, accompanied by the introduction of corporate means of financing, created situations which had their serious repercussions in a state like Vermont, isolated from the sea, unpossessed of mineral resources of magnitude, and dependent on agriculture and its kindred pursuits for the livelihood of its inhabitants. Opportunities on the outside in both New England and in the West, when offered youth possessed of a natural thirst for amusements, adventure, and the satisfaction of its ambitions, could not but lure from the Green Mountain State its richest possession—the inheritors of its soil and traditions.

Another influence which bore heavily on Vermont's well-being was the tariff issue which perhaps had almost as much to do with the outbreak of the Civil War as the slave question. Moderate in their burden in the first years of Vermont's

statehood, duties on imports were gradually increased in response to the demands of northern manufacturers and producers of raw materials in competition with foreign sources. Against this policy the cotton growing, non-manufacturing southern states were arrayed almost to the point of open conflict in the 1820's and 1830's, until they were successful in bringing about a lowering of duties in the 1840's which, among other things, laid low the raising of sheep in Vermont, its leading source of income.

Enough perhaps has been said to demonstrate that a combination of domestic and world-wide events has had a major part in the molding of the nation's history. Transportation has laid at the root of all of them, whether by ocean and inland waterways, by highways and railroads, or by pipelines and in the air. As has already been said, a knowledge of the situation in its broadest sense has seemed necessary for a full understanding of the part played in it by Vermont.

Bibliographical References: Nos. 2, 3, 13, 15, 23, 24, 32, 36, 47, 59, 88, 89, 95, 96.

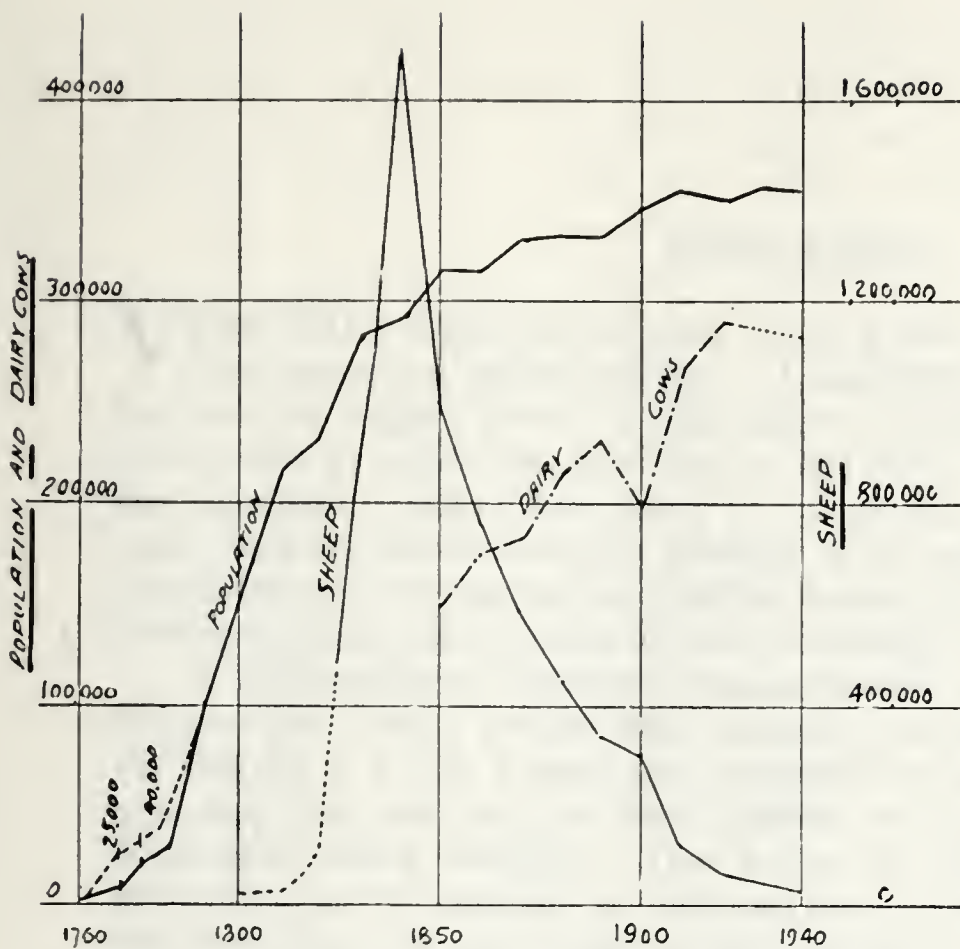


Fig. 4
DIAGRAM

POPULATION	
1776-1800	7,000
1800-1825	85,925
1825-1850	159,465
1850-1875	217,895
1875-1890	235,891
1890-1900	280,652
1900-1910	291,948
1910-1920	314,120
1920-1930	315,098
1930-1940	330,551
1940-1950	332,286
1950-1960	332,422
1960-1970	343,641
1970-1980	355,956
1980-1990	352,428
1990-2000	359,611
2000-2010	359,231
SHEEP	
1824	475,000
1828	700,000
1837	1,100,000
1840	1,681,800
1845	1,014,122
1850	752,201
1855	580,347
1860	439,870
1865	333,947
1870	297,521
1875	118,752
1880	62,756
1885	-
1890	17,425
DAIRY COWS	
1845	145,128
1850	174,667
1855	180,285
1860	217,013
1865	231,419
1870	122,603
1875	265,487
1880	290,122
1885	-
1890	281,883

VERMONT URBAN POPULATION, 1920 (Places of 2500 or More)

St. Lawrence R. Hudson R. Connecticut R.

Basin	Basin	Basin
1 Burlington 27,686	4 Brattleboro 9,622	
2 Rutland 17,082	8 St. Johnsbury 7,757	
3 Barre 10,900	10 Springfield 5,182	
5 St. Albans 8,037	12 Belknap Falls 4,236	
6 Montpelier 8,006	13 Windsor 3,402	
9 Winooski 6,036	7 Bennington	
11 Newport 4,902	7628	
14 Waterbury 3,074		
85,732	7,628	29,879
76%	6%	24%
123,239		
(34% of State Population)		

VERMONT Decennial Increases of Population

Oct 1760-1771....		7,000
I- Rise 1760-1783 (25 Yrs.)	1771-1776....	13,000
	1776-1783....	10,000 Rev. War
	1783-1790....	55,425
II- Marked Rise 1783-1810 (45 Yrs.)	1790-1800....	69,040
	1800-1810....	63,430
	10-20....	17,926 War of 1812
III- Lessened Rise 1830-1870 (40 Yrs.)	20-30....	44,761
	30-40....	11,296 Panic of 1837
	40-50....	22,172
IV- Stationary 1870-1890 (20 Yrs.)	1850-60....	978 Panic of 1857
	60-70....	15,453
	70-80....	17,355
V- Small Rise 1890-1910 (20 Yrs.)	80-90....	136
	90-1900....	11,219
	1900-10....	12,315
VI- Stationary Again 1910-1940 (30 Yrs.)	10-20....	0-3528
	20-30....	7,183
	1930-40....	0-380*
180 Years, Total		+ 363,139 - 39,08
		359,231

* Great Depression

Bib. Ref. 16, 61, 59, 63, 93, 95

Figure 4 Diagram: Population and Livestock

V

POPULATION

VERMONT measured by size and rate of growth of population shows up badly from causes not difficult to trace. Unparalleled for beauty, this very virtue has made its rugged surface in large degree difficult or impossible to farm with profit; and its remoteness from the sea has barred the wholesale importation of raw materials it lacks, from which to manufacture outbound finished products. Apart from its scenic charm, the qualities of the region obvious to the eyes of the early settlers were its forests and wild life, doomed in large part to exhaustion within a hundred years, and the opportunities there offered for an independent way of life.

A full knowledge of Vermont's unique position as a thoroughfare between New England and Canada and the West, however, was not to come until the advent of the railroad at a time when forests available for large-scale exportation were approaching their end, and the state's leading source of income, sheep, was on the down-slide toward extinction. That was in the 1840's, but relief then sought in other directions, to maintain the previous rate of growth of population since 1760, was of no avail. As will be seen on the accompanying diagram (Fig. 4), the substitution of dairying for the raising of sheep, and the promotion of the state's granite, marble, slate, and other mining industries, did not save the day.

It is with this general situation in mind, reflecting as it does the bearing of its physiography, resources, struggles of rival claimants and external influences on Vermont's development, that attention may be directed to the peopling of the region before and after the barriers to its settlement were lowered at the end of the French and Indian War. Thus it is that a groundwork may be laid for giving thought to the state's means of movement, its transportation, without which the gradual building of a civilized society would have been impossible.

As already mentioned, the only human inhabitants of the Vermont country for 150 years after the coming of Champlain, were warring Indian nomads and white men, other than a few explorers, hunters, fishermen, traders, and missionaries, as well as settlers in small numbers in widely scattered places. To the French is to be given credit for the earliest pioneering. In 1666 they had erected the first church for Christian communicants in the region, on Isle La Motte, preceded and followed by other small gatherings along or near the shores of Lake Champlain, of which the more prominent was the one started about 1730 at the site of Chimney Point and after a prosperous life of nearly thirty years abandoned when New France fell. In the Connecticut River valley there was the trading post established at

Fort Dummer in 1724, in which year the Dutch in small numbers are said to have been present in the Hoosic River valley in what is now Pownal. Between 1737 and 1760 some settlers had also drifted within the sites of Vernon (Hinsdale), Dummerston, Putney, Westminster, Rockingham and Springfield. The white population of the region as a whole has been variously estimated; at its peak it may have numbered perhaps a thousand toward the end of the nomad period.

With the coming of peace the real rush started in 1761-62 and the frontier was gradually pushed northward for fifty years along lines of least resistance—the streams and lakes—toward Canada. At the outbreak of the Revolutionary War the towns along the Connecticut River had their sprinklings of newcomers as far as Barnet, and north of there in Lunenburg and Maidstone; also in the second tier of towns as far as Stratford and in Peacham; and in several instances even in the third and fourth tiers in the rear. On the other side of the state from one to two or occasionally three tiers of towns were thus early settled, extending with few exceptions from Pownal through Bennington along the New York border, and in the valley of Otter Creek, and along the shores of Lake Champlain to Colchester from which a jump was made to Swanton. By 1770-71 the population had grown from a thousand, more or less, to 7000 according to Zadock Thompson, or 25,000 as given in *A Century of Population Growth* published by the Federal Government in 1909. During the War of Independence, despite its ravages, settlements in the state spread inward in some towns as far north as the lower Winooski and Lamoille River valleys, and to St. Albans and the larger islands in Lake Champlain. By the end of the war the population had grown to 30,000 as indicated by Thompson for 1783, or 40,000 for the year 1780 as reported in the above mentioned federal publication.

Following the Revolutionary War settlements spread still farther into the interior of the state, in particular north of the Winooski River to include headwaters of the Lamoille River, the population by 1791 having reached 85,425 according to the national census. It was not until 1812, or thereabouts, that settlements were made in most of the far north interior towns along the Canadian border.

The accelerated growth of population may be said to have started in 1780, and increased by leaps and bounds until 1810 when the number had grown to 217,895, and following a let-up during and just after the War of 1812, to 280,652 in 1830. It is worthy of note that the increase of 60 per cent in population from 1770 to 1780 was the greatest in New England except in the state of Maine; and upward of 113 per cent from 1780 to 1790, exceeding that of any other of the seventeen states.

From 1830 the ascent sharply flattened, as shown on the diagram (Fig. 4), until the population numbered 355,956 in 1910. Then for thirty years the population was practically at a standstill, numbering in 1940 only 359,231 souls.

From the diagram it will also be seen that for 180 years, from 1760 to 1940, the

decennial increases of population may be divided into six stages: the first 25 years exhibiting a moderate growth checked by the numbing effects of the Revolutionary War; the second a marked rise for 45 years hindered somewhat by the retarding influences of the War of 1812; the third a lessened rise for 40 years marred by a downward plunge in the number of sheep and the panics of 1837 and 1857; the fourth a stationary population for 20 years during which the panic of 1873 had its baneful influence; the fifth a returning rise though of small moment for 20 years at a time when the opening of World War I was in the offing; and sixth a recurrence of stagnation for 30 years during which the World War and its aftermath, and the great depression with its threat of a new World War, had their part in making of Vermont a static region in contrast with its fifty years of dynamic growth between 1780 and 1830.

In the beginning transportation, though primitive, was a hand maiden to the settler, bringing to him his simple needs from the outside world and taking away in exchange his surplus products—pot and pearl ashes, logs, lumber, cereals, provisions, animals, copperas and maple sugar—to markets whence they were shipped for domestic consumption in other states and Canada and in response to urgent calls from overseas.

The coming to the Union of improved means of transportation, after 1825, helped the Vermonter to dispose of weightier products that otherwise would have lain fallow, such as marble, granite, slate and manufactures on a moderate scale; but such means were at the same time instrumental in luring from his fireside his children yearning for the better opportunities offered at the seaports and their neighboring factory towns, in rapidly growing inland cities and in the more promising agricultural West. In balance the latter influence won, aided as it was by the effects of a declining sheep culture and the approaching exhaustion of soil and forest in the 1830's and later.

In general the situation is well portrayed in the following extract from the federal publication to which reference has been made: "In 1900, as compared with 1790, New England showed a greater decrease in the size of family than the other sections of the original area; the proportion of families having 8 members was less than one-half as great in 1900 as in 1790, and the proportion having 10 members less than one-third as great in the later year. In the state of Vermont the proportion of families having 10 members dropped to one-fourth . . . The progress of the nation from 1790 to 1900 has involved far-reaching social changes, during which the inhabitants have gathered from farm and frontier into densely settled industrial centers."* As late as 1800 two-thirds of Vermont's inhabitants are said to have been under 26 years of age and even more than that in earlier years, a figure that ever since has been steadily mounting until now the state is looked on as a home for elderly people.

*Bib. Ref. 95, p. 99.

The first of these is the fact that the system is not a simple one. It is a complex system, and the complexity is not only in the number of variables, but also in the nature of the variables. The second is the fact that the system is not a simple one. It is a complex system, and the complexity is not only in the number of variables, but also in the nature of the variables. The third is the fact that the system is not a simple one. It is a complex system, and the complexity is not only in the number of variables, but also in the nature of the variables.

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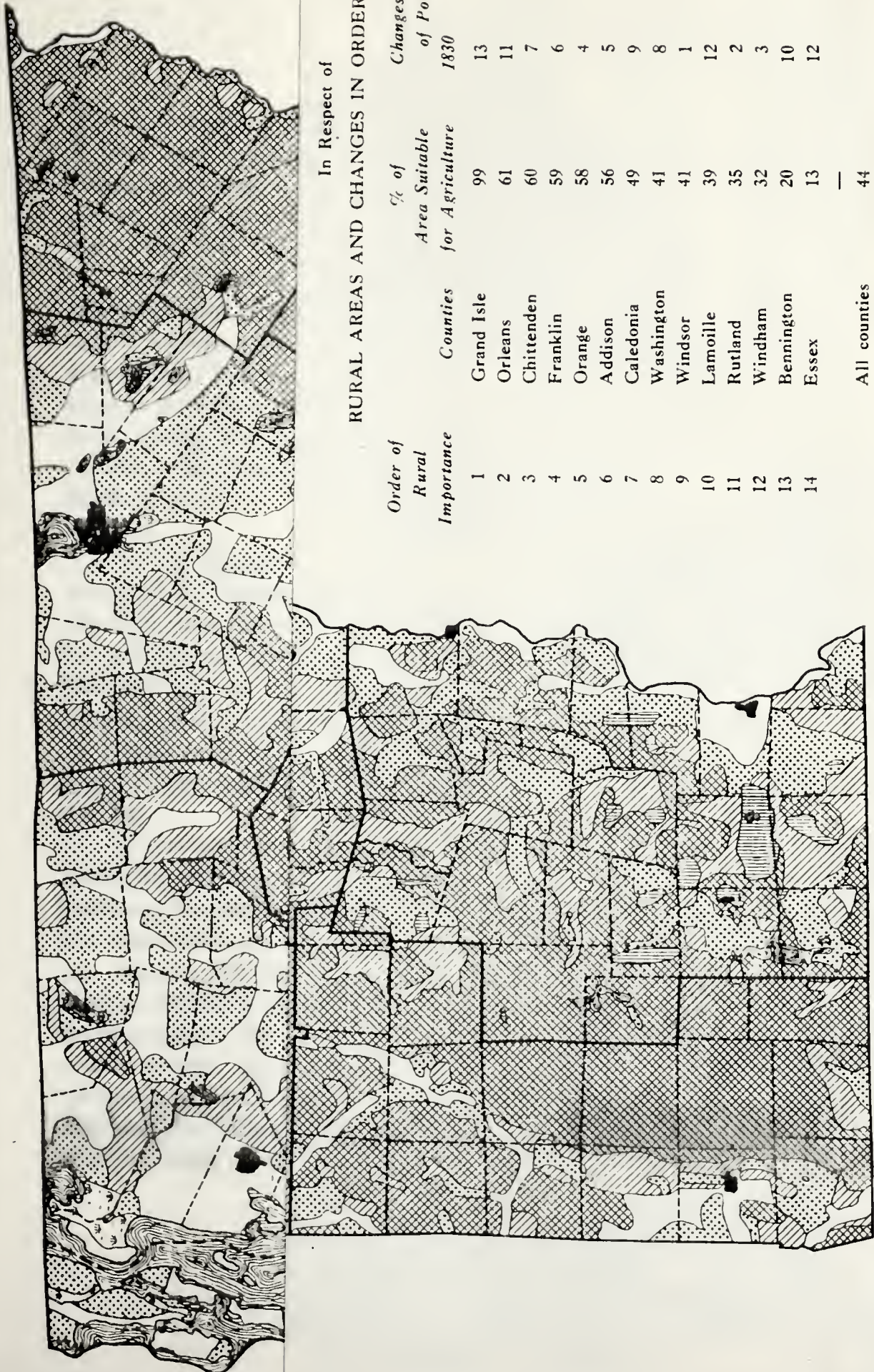
Throwing a vivid light on the uphill plight of the Vermonter beginning a hundred years ago is the accompanying map prepared in 1940 (Fig. 5), showing the areas in the state in which the lands are definitely unsuited to agriculture, and those in which farm properties are, generally speaking, poorly adapted to agricultural use. Their aggregate area, including urban, recreational and swamp lands, is 56% of the total. Thus it is that but 44% of the state, or less than one-half, is usable for the winning of a reasonable livelihood from the land.

It should be noted that the counties possessing the larger percentages of rurally useful land areas are in the main in the state's northern half—Grand Isle, Orleans, Chittenden, Franklin, Orange, Addison, and Caledonia; two only, Essex and Washington have less than the average for the state, of which the latter's is but slightly so. In a word it is in that section that agricultural pursuits have been in the forefront. Except in the instances of Orange and Addison counties, their position in order of population has been upward or at the worst static, owing to the growth of their eight industrial centers which hold nearly two-thirds of the total population of the state's fourteen urban communities of 2500 or more according to the 1940 census. Had it not been for its urban growth between 1930 and 1940, the state's rural loss in that period would have made for the state a much worse showing than its net decennial decrease of 380 to 359,231 in 1940. It is also to be noted on the map that the fertile areas follow the streams and shores of lakes, there inviting both settlement of population and its means of transportation. In fact it was the coming of the railroad that accentuated this trend from the infertile uplands, ill-served by means of movement in and out.

It is not to be wondered at that Vermont, taken as a whole, has not profited in a material sense from advances in the art of transportation since the coming there of the steamboat in 1809, the first through line of railroad in 1849, the motor car in 1897-1900, the airplane about 1910 and the pipeline in 1941.

Two centuries of primitive means of movement from 1609 to 1809, followed by a century and a third of modern means down to the present day, have in the end, therefore, been unable to bring material prosperity to a state, isolated as it is from contact with the sea and meagre within its borders of long-lasting natural resources for sustaining and promoting human life. Its one possession in which it is rich beyond compare, its beauty, yet lies fallow and in need of protection and enhancement in the interest of the state and nation. Transportation in the future may perhaps save Vermont from the doldrums, by making its cultural and recreational areas, if and when suitably developed, more accessible by air, and its historic waters along the western border more useful without injury to their beauty. An aging and stationary population thus may be given new life.

Bibliographical References: Nos. 2, 13-17, 27, 36, 57, 59-63, 71, 85, 91, 93, 95, 97.



In Respect of					
Order of Rural Importance	Counties	% of Area Suitable for Agriculture	Changes in Order of Population		Up or Down
			1830	1940	
1	Grand Isle	99	13	14	Nearly Stationary
2	Orleans	61	11	9	Up
3	Chittenden	60	7	1	Up
4	Franklin	59	6	5	Up
5	Orange	58	4	11	Down
6	Addison	56	5	10	Down
7	Caledonia	49	9	7	Up
8	Washington	41	8	3	Up
9	Windsor	41	1	4	Down
10	Lamoille	39	12	12	Stationary
11	Rutland	35	2	2	Stationary
12	Windham	32	3	6	Down
13	Bennington	20	10	8	Up
14	Essex	13	12	13	Nearly Stationary
	All counties	—	44		

(PREPARED BY THE DEPARTMENT OF AGRICULTURAL ECONOMICS OF THE VERMONT AGRICULTURAL EXPERIMENT STATION)

P. 37-40

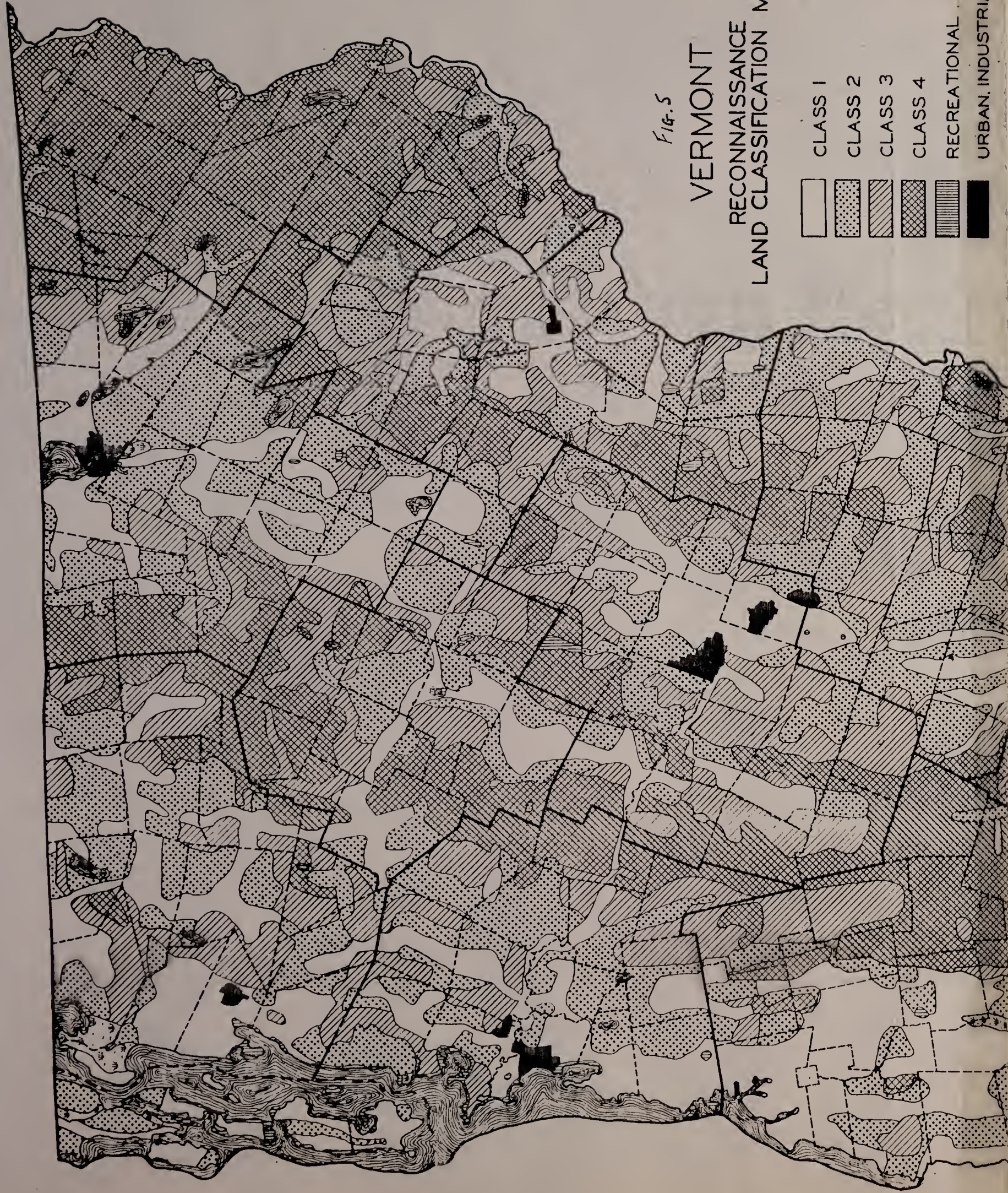


Fig. 5
VERMONT
RECONNAISSANCE
LAND CLASSIFICATION MAP

- CLASS 1
- CLASS 2
- CLASS 3
- CLASS 4
- RECREATIONAL
- URBAN, INDUSTRIAL

D. E. F. INITIATION OF LAND CLASSES

Class 1. Areas in which agricultural income has been sufficient to provide, and to maintain in excellent condition, ample facilities for living and for the conduct of the business of farming; lands which are adapted to intensive dairying or to a combination of dairying and cash crop production. In a general way it comprises the level to rolling bottom lands of the Champlain Valley and the river valleys, together with a small amount of the more fertile, level, and stone-free terrace and hill lands. Soils are mostly loams and clay loams and are to a large extent calcareous.

Class 2. Areas in which agricultural income has sufficed to provide and maintain adequate facilities for living and for the conduct of the business of farming; lands which are well adapted to dairying and crop production. For the most part it is made up of the better hill farming sections, but includes also some of the flood lands and the heavier clays of the valleys. With this exception, the soils are predominantly loams and sandy or gravelly loams and are quite generally acid. Stoniness and rough topography interfere with tillage operations to some extent.

Class 3. Areas in which the income from agriculture has proven insufficient to provide and maintain adequate facilities for living and for the conduct of the business of farming, and in which farm properties are, generally speaking, depreciating; areas which, because of the scarcity or the inferiority of their crop and pasture land, are poorly adapted to agricultural use. The class embraces chiefly the poorer hill farming sections, but includes also scattered areas of light, sandy soils of inferior quality. Soils are mostly sandy and gravelly loams, tend to be shallow and infertile, and are nearly all acid. Stoniness and rough topography make tillage operations difficult.

Class 4. Areas in which no agriculture has ever been established, or in which returns from farming have been so low that the land has been or is being abandoned in so far as any agricultural use is concerned; which, because of rough topography, stoniness, unproductive soils, or all three, are definitely unsuited to agriculture and adapted primarily to forestry.



RELATION OF COUNTIES

In Respect of

RURAL AREAS AND CHANGES IN ORDER OF POPULATION

Order of Rural Importance	Counties	% of Area Suitable for Agriculture	Changes in Order of Population	
			1830	1940 Up or Down
1	Grand Isle	99	13	14 Nearly Stationary
2	Orleans	61	11	9 Up
3	Chittenden	60	7	1 Up
4	Franklin	59	6	5 Up
5	Orange	58	4	11 Down
6	Addison	56	5	10 Down
7	Caledonia	49	9	7 Up
8	Washington	41	8	3 Up
9	Windsor	41	1	4 Down
10	Lamoille	39	12	12 Stationary
11	Rutland	35	2	2 Stationary
12	Windham	32	3	6 Down
13	Bennington	20	10	8 Up
14	Essex	13	12	13 Nearly Stationary
	All counties	—	44	

VI

PRIMITIVE TRANSPORT

IN Champlain's time transportation, in essence, was as primitive as when cave men first began to trade and travel. Wind, current and the tides, domestic animals and man himself were the only means by which persons and property were moved from place to place; they so remained until the power of steam came into use in the 18th Century of the Christian era.

True it is that through countless ages the vehicles employed in transport were gradually altered for the better. The drag, stoneboat, sledge, cart on wooden disks called wheels, raft, dugout and canoe gave way to the covered 4-wheel wagon, stagecoach, bateau, flatboat and sailing vessel, as did the pathway and unruly stream on which they moved give way to the turnpike and canal. In this, however, things had practically reached a standstill, insofar as propulsion was concerned, when the perfecting of the steam engine revolutionized transportation and made of it an art. Civilization thus was given a tremendous impulse for both good and evil.

In his discovery of the lake named after him, Champlain had not even the winds at his disposition, for his tiny *chaloupe* was stopped by falls and rapids on the Richelieu River. It was to the red man's birch-bark canoe that he had to turn for journeying onward. Twenty-four of these silently paddled primitive craft bore him and his two white companions and sixty Algonquin allies, with their impedimenta, southward on the broad bosom of the lake, hemmed in by green mountains, to a cape reputed to be the one on which Fort Frederic was to be built 122 years later. Such was the event that marked the birth of civilization in so-called Iroquoisia.

It was the Indian canoe and bateau on which the white man thenceforth long relied for the movement of his armed forces and their supplies, of merchandise in exchange for skins and furs, and of supplies intended for such settlements as the one started about 1730 at the site of Chimney Point.

Among the earliest records of a sailing vessel on the lake is that telling of Kalm's visit in a "yacht" in 1749 to the village at the latter place found by him to be charming. By 1770 boats propelled by sails appear to have been quite commonly in use, as instanced by the sloop belonging to Major Skene of Skenesboro (Whitehall), which was engaged in the conveyance of products of the country destined for Montreal and New York, and other points north and south, and in bringing back necessities not to be found at home. After 1823, as will be explained

later, the sailing vessel gradually gave way to steam first introduced there in 1809; the canoe as an element to be considered had long since vanished.

Shortly after the loss of New France to the British, rafts on Lake Champlain, supplementing the canoe, came into being for the floating of logs, timber products, pot and pearl ashes, and provisions, down the Richelieu and St. Lawrence Rivers to Quebec whence they were shipped to the English market. They so continued until the opening of the Champlain Canal in 1823, and the depletion of available Vermont forests in the 1840's, brought this northbound movement almost to a close; thenceforth, in the main, it was in the reverse direction.

What has thus been said refers to the season of open navigation. In winter the lake became an avenue of ice traversed by men on foot, often equipped with skates, carrying burdens on their backs and hauling sleds and sleighs aided by dogs, and in time by horses and oxen.

It should be remarked that the interchange of products across the border, after the close of the French and Indian War, had of course been interrupted during the Revolutionary War, and was forbidden for the first few years after the treaty of peace had been signed in 1783; but the urge for trade on both sides soon had its outcome in the abatement of restrictions on shipments on the Lake Champlain route, in which Ethan and Ira Allen had a leading part. In 1795, the bars were still further lowered, under the terms of the Jay Treaty, and remained so for some thirty years, except in the period leading up to and during the War of 1812 when smuggling replaced legitimate cross-border transport.

East of the mountains primitive transport on the Connecticut River was the only means of movement for Indian and white man in conflict prior to 1760, and thereafter for a growing trade southward with the English colonies, later to become states, in sharp contrast with trade northward with the British provinces via Lake Champlain. In the open season canoes, small rafts and dugouts at first were the only means of travel and shipment on the river. After about 1770 they were replaced by small flatboats floating downstream to be broken up and sold at their destinations on the lower Connecticut, or operated both ways between the falls around which the freight was portaged; also by rafts of growing size adaptable to navigation through falls and rapids. In the long winter months resort was had to the surface of the frozen river for movements by foot, on horseback, and by sleds drawn by slow-paced men and oxen and other animals. On both flatboats and rafts were carried outbound the surplus products of the country, and inbound its modest necessities unobtainable at home. So things continued until the opening of the 19th century as dwelt upon in the next chapter.

Attention may now be turned to cross-country means of transport employed on land and stream between bordering waters flowing south in the Connecticut River and north in Lake Champlain. As on the lake those of the Indian were here adopted by the white man upon his arrival on the scene, and little change in them was made up to the close of the French and Indian War.

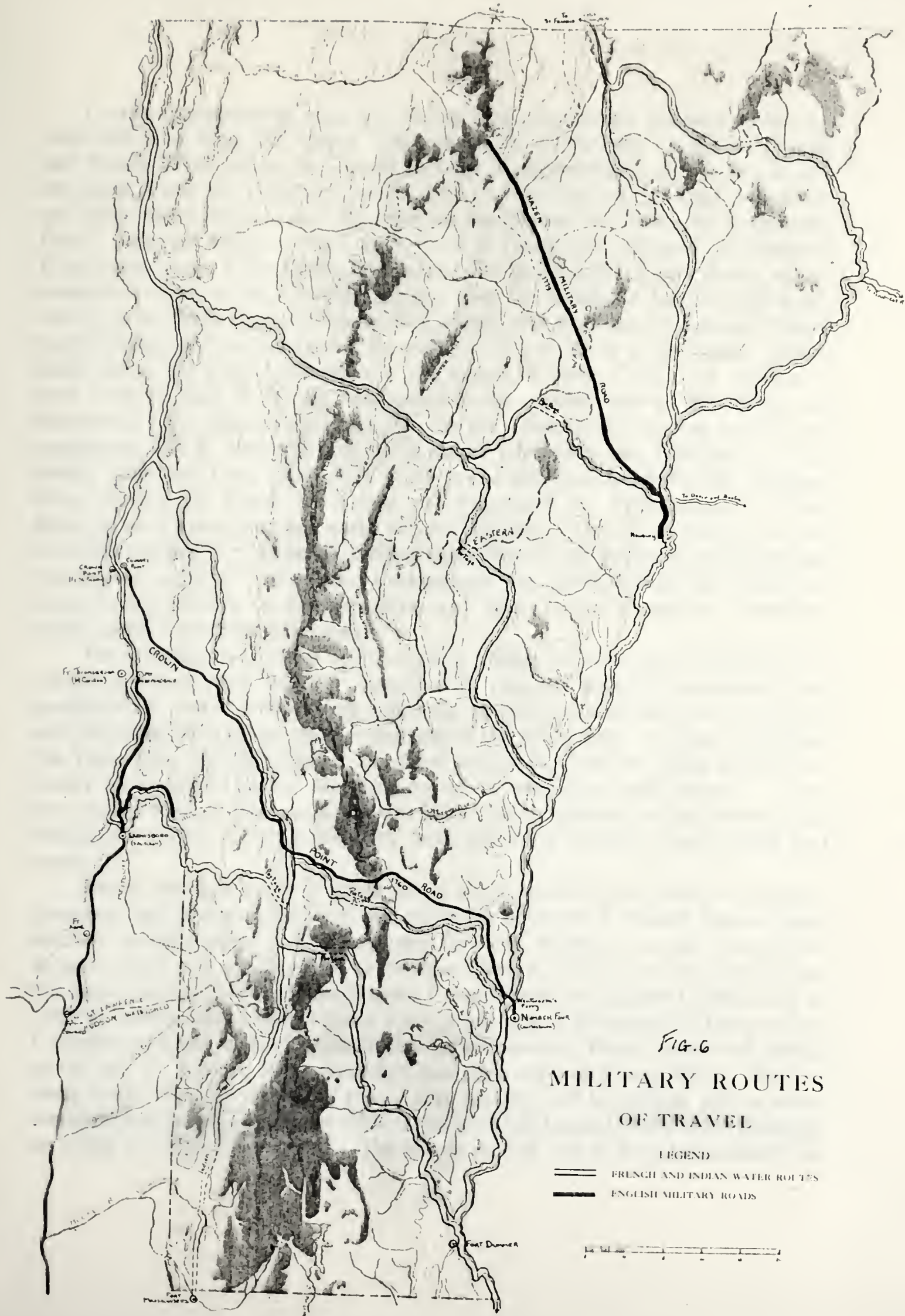
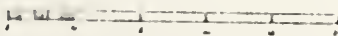


FIG. 6
MILITARY ROUTES
OF TRAVEL

LEGEND

- FRENCH AND INDIAN WATER ROUTES
- ENGLISH MILITARY ROADS



On the accompanying map (Fig. 6) are shown the routes followed by the Indians and after them the whites. The one on the north came up the St. Francis and Magog River valleys in Canada to Lake Memphremagog and thence in two directions across the Height of Land to the Connecticut, one up the Clyde River and down the Nulhegan, and the other up the Barton and down the Passumpsic River. Another, known as the French Road or Trunk Line, followed the Winooski River valley from Lake Champlain to the site of Montpelier and thence by alternative courses to the Connecticut, one over the Height of Land to the headwaters of the Wells River and down that valley, and the other up Stevens Branch to the Height of Land and down the valley of White River to its mouth. Still a third course left Lake Champlain at the mouth of Otter Creek, and passing up that valley crossed the Green Mountains in the present town of Mt. Holly and thence down the valley of the Black River to the Connecticut, together with a short connecting link in what are now the towns of Clarendon and Wallingford. The fourth route left Lake Champlain at its lower end, and following the Poultney River crossed the Green Mountains and descended the Wantastiquet or West River to the Connecticut just north of Fort Dummer. There were others, too, one of which starting in Cavendish utilized the valley of the Williams River through the present towns of Chester and Rockingham, and another along the West Vermont Valley leading to Massachusetts and New York. Countless unrecorded minor paths criss-crossed the region.

The streams along these routes, swiftly falling in their upper reaches, were navigated where practicable by canoes, with portages between headwaters, and paralleled by narrow Indian trails originally trodden by moccasins and snowshoes and deepened later by the coarser footgear of the white man. As time progressed the trails were slightly widened for dog-drawn sleds, then for riding horses, and finally for ox-drawn sledges and carts as the country filled with settlers. It was the crudest form of transportation threading a most difficult terrain clothed with continuous sombre forests habited by beast and birds of prey as well as fish and game.

Among the first roads of white man's origin were the two built for military purposes, also shown on Figure 6, one under the direction of Colonel Moses Hazen starting northwestward from the present town of Newbury on the Connecticut River in 1776, and completed as far as Hazen Notch in 1779; and the other under the supervision of Major Zadoc Hawks, Colonel Stark and Colonel John Goffe in 1759-60, known as the Crown Point Road, beginning at Wentworth's Ferry on the Connecticut River, a short distance above the mouth of Black River, and ending at the site of Chimney Point on Lake Champlain opposite Crown Point. Both of these roads, with the coming of peace, were eagerly used by settlers who in many instances had traversed them as soldiers and thus had learned of the better locations on which to "pitch their tents." The former road is said to have been closely fol-

lowed by the first regular stage line between Boston and Montreal; and the latter, for many years known as the Great Road, was in part utilized by various towns as the principal means of communication with neighboring communities and the outside world. Other roads of less importance were in existence before and during the Revolutionary War, as for instance one from the Crown Point Road to Fort Independence on Lake Champlain opposite Fort Ticonderoga, and the one cut by the Allens between Castleton and Colchester via Vergennes and Shelburne Falls in 1772. In fact, numberless travelways of the crudest kind came into being as the country became more and more settled after 1760; but their purpose was largely local without regard for any general plan until widened needs of intercommunication gradually brought about their coalescence.

By 1791 the towns of Vermont had not only widened their original blazings and bridle paths sufficiently to accommodate ox-drawn carts leading to nearby little villages; but they had also created, as indicated on the accompanying map (Fig. 8) through routes claiming the proud title of highway. They extended north and south on both sides of the state from one end to the other, and east and west connecting the Connecticut and Lake Champlain valleys. They joined with corresponding highways in New Hampshire by canoe and chain ferries and by bridges over the Connecticut at Bellows Falls built in 1785 and at Windsor in 1796; also with public roads on the south in Massachusetts, on the west in New York and on the north in Canada. As a rule they were poorly built and miserably maintained as were nearly all the highways in America in that era. In fact a century was yet to pass before measures were adopted that would fit the larger portion of them for modern travel. As will be pointed out in the chapter that follows, turnpiking by private companies helped in this in some degree, but not to such an extent as to make them comfortable for passengers or economical for transporting freight.

Communication of thought by letter was given early attention in the state after the War of Independence was won, as instanced by the immediate establishment of a public mail service at the hands of post riders, and as early as 1797 by stages over what were then considered to be good roads between Bennington and Albany, Brattleboro and Westminster, Manchester and Rutland, and Fairhaven and Lake Champlain and elsewhere.

In general it is to be said that primitive transport on land and water in the Vermont country changed little if any for the better from its discovery by Champlain in 1609 to the fall of New France in 1759, one hundred and fifty years, and then but little for another forty years ending as the 18th Century reached its close. Domestic animals, wind and current, and man power were still the means of propulsion as they had been in the days of Noah, and the channels over which they moved had been little improved by the hand of man. The new century was about to open for him a new vista of world-shaking advances in the art of transportation, of which there was no conception at the time—except in the minds of such dreamers

in America as John Fitch, James Rumsey, and Captain Morey of steamboat fame, Oliver Evans often called the James Watt of America, Robert Fulton and John Stevens, and of geniuses in Great Britain and elsewhere in Europe who were world leaders in mechanical invention and canal and highway engineering. What may be termed a transition period followed in Vermont, during which primitive means of transport, both vehicles and their channels of movement, were supplanted step by step by better roads, steamboats, canals, railroads, motor vehicles and airplanes, until in the twentieth century transportation in all its parts came of age.

Bibliographical References: Nos. 4, 6, 10, 13, 14, 16, 18, 19, 26, 27, 32, 34-36, 43, 44, 52, 54, 57, 59-62, 69, 70, 85, 87, 91, 98.

NOTE ON EARLY MAPS OF VERMONT SHOWING ROADS

Most of what we know about the early Vermont road system is derived from a single rare map (only two copies today exist) compiled by William Blodget of Bennington, and published by Amos Doolittle in New Haven in 1789. Blodget depended for his knowledge of the roads upon informants in the various towns, many of whom failed to report. On his map, therefore, roads frequently end abruptly at the town lines. This, then, is the source of information for the map *Vermont in 1791*, on page 49.

Despite its inadequacies, Blodget's map was all that the engravers and publishers had for many years, and it was copied extensively. Even James Whitelaw (who was to issue in 1796 an extensively detailed map of roads) copied one of Blodget's boundary errors in his 1793 map for Samuel Williams' *History of Vermont*. But the most slavish copies were made by Amos Doolittle and J. Reid in 1796. The latter's map, a miniature of the original (with no credit to Blodget, however), is reproduced on page 48. It adds nothing to the original except to complete the gap in the "Road over the Mountain" from Rutland to Royalton. It does not, for instance, show the branch northward off the Hazen Road which Hemenway's *Gazeteer* reports was built due north into Canada in 1793-1794. Yet, despite Whitelaw's detailed map of the same year (a huge wall map of the size of Blodget's), atlas publishers continued to use Reid's and Doolittle's piracies for decades after.

EWN



Figure 7: J. Reid's 1796 Map of Vermont



VII

STEAMBOATS, TURNPIKES AND CANALS

VERMONT had no sooner been admitted to the Union than its interest in improved means of transportation gained increasing strength. The industry and enterprise of its youth in fast growing numbers were having their reward in surplus products that sought an outlet. Rival markets were soliciting its trade from four directions—the tidewater port of Hartford, Connecticut, and other towns on the lower Connecticut; the ports of Boston, Portsmouth and Portland served by highways overland; the port of New York via Lake Champlain and the Hudson River; and the Canadian ports of Montreal and Quebec reached by the waters of Lake Champlain and the Richelieu and St. Lawrence Rivers.

To profit by these opportunities something had to be done to overcome the difficulties of navigation on lake and river, and to lessen the time and expense of highway transport. To let things go unimproved would spell stagnation and even ruin. Providentially there had been an inkling of a way out when John Fitch had proven the practicability of the steamboat on the Delaware River in 1787, followed by Captain Samuel Morey's revealing experiment with a similar device at Fairlee, Vermont, in 1792-93, and by the triumphant ascent of the Hudson River by Robert Fulton's *Clermont* in 1807. The time was ripe for the appearance of James and John Winans' steamboat *Vermont* on Lake Champlain in 1809,* a dramatic ending to the two hundred years of primitive propulsion in vogue there since Champlain's discovery of the lake in 1609.

News too of advances in the arts of canal and road building in Great Britain had reached Vermont, to stimulate interest in means for passing boats and rafts around falls and rapids in the Connecticut River without the necessity of portaging, and in methods whereby the state's leading highways might be freed from sandy stretches, quagmires, ruts and unnecessarily steep gradients in a mountainous country at best difficult to traverse. The taxpayers of Vermont were in no position to finance improvements of this nature from the public purse, so recourse was had to private capital in the building of turnpikes soon undertaken, and the by-passing of falls and rapids where encountered. Progress in the use of the steamboat was more chequered. To the Connecticut Valley is due the credit of having made the first move in this; it was there that early settlers, dependent on rafts and flatboats, were more in need of waterway improvements than on deep and placid Lake Champlain. Simultaneously with the commencement of highway betterments came the

*Launched in 1808.

chartering of a company in 1791 for the building of the Bellows Falls canal, and its construction by English capital under the direction of versatile Dr. William Page, the ancestor of one of Vermont's governors. Its opening to use in 1802 was followed by similar measures at Sumner's Falls in the town of Hartland, and at Olcott's Falls (now Wilder), began in 1810. While this was going on in Vermont, interests in the states south of there were not idle. In Massachusetts the Turners Falls and South Hadley Falls canals were put in service in 1795, seven years in advance of Bellows Falls; but the one at Windsor Locks in Connecticut was not completed until 1828-29. Six canals around river obstructions from 15-mile (McIndoes) Falls above Barnet on the Upper Connecticut to tidewater at Hartford were thus brought into being after the long lapse of nearly forty years following Vermont's initial move in 1791.

In the interim much more ambitious canal projects were topics of heated discussion in the valley, and for that matter in all Vermont and in its neighboring states. The example set by the Erie Canal, actively started in 1817 and opened in 1825, gave rise to what was termed the "canal mania." Along the Connecticut River between 1824 and 1831, "riverites" led by the Connecticut River Company and "canalities" sponsored by the Connecticut River Canal Company, fought angrily for supremacy, the former for the canalizing of the stream and the latter for artificial canals along its margins. But this was not all. Connections by canal in 1825 were proposed across the Green Mountains and Height of Land from Burlington on Lake Champlain to the Connecticut River via the Winooski River valley to Montpelier and thence by alternate routes in the Wells and White River valleys to their mouths. Likewise projects were advanced for a canal from the Connecticut River via the Passumpsic River valley, Lake Memphremagog and the Lamoille River valley to Lake Champlain. Connecting canals beyond the Green Mountain State were proposed, in Massachusetts, eastward to Boston and westward to the Hudson River. One and all they died abornin' when the superior merits of the newly invented railroad under these conditions were made clearly evident in the late 1820's and early 1830's.

With the step by step removal of limitations at its various falls after 1795, the Connecticut River increasingly became a scene of animation. Rafts of logs in great number swept southward carrying the products of the country, lashed together in widths of as much as 36 feet and lengths of upward of 180 feet, made separable into convenient parts for passage through the locks and reassemblage for the continued journey.

Flatboats were no longer condemned in large part to a one-way journey, and their use for freight was expanded to accommodate passengers in reasonable comfort in contrast with the hardships of alternative means of travel by horseback and ox-cart on land. Equipped with mainsail and topsail they were propelled by winds when favorable, and by laborious hand-poling and oars when that means failed.

Their speed was of course very slow, especially upstream, so that a round-trip voyage between the important warehouse terminal at Wells River and similar facilities near Hartford would take as much as twenty-five or thirty days. Their draft was held at from 18 inches or less to three feet to minimize frequent groundings, their capacity ranged from 20 to 40 tons, and their dimensions attained upward of 70 feet in length and 12 feet or more in width. Increasing flashiness of the river's flow, owing to the gradual depletion of the moisture holding forests, more and more hampered navigation in the low and high water seasons as the years went on. Efforts to minimize these many drawbacks through the use of steamboats were made on several occasions between 1826 and 1831, but in every instance they resulted in failure. Primitive means of propulsion on the upper Connecticut persisted until the coming of the railroad in the 1850's brought river traffic practically to an end, despite improvements at governing points.

During the half century of such intense activity on the Connecticut River, then the region's main artery of commerce, life along its banks was indeed colorful. Tied up at night along its banks, crews and passengers on both rafts and flatboats who could not be cared for on board were camped in adjoining meadows or put up at neighboring farm houses and inns. Boatmen's and raftmen's songs and picturesque—not to say shocking—language enlivened the valley even more than did the locomotive's more decorous peal of bell and musical sound of whistle in the years to come. Bustle reigned at frequent landings along the river where freestone, wool fleece and cloth, copperas, maple sugar and syrup, farm produce, animals, pot and pearl ashes, ginseng and timber products were hustled on by roustabouts; and tea, coffee, salt and condiments, molasses, sugar and rum, cloth, clothing, grindstones and household furnishing of a better sort, and hardware and iron and merchandise in general were tumbled off. Passengers while waiting passed the time of day with the populace who flocked there for amusement and news from the outside world. The river then so pulsing with life has but to be looked at now in its total solitude, to realize what momentous changes long since came to the valley with the passing of primitive means of transport.

On the Lake Champlain side of the state, where sailing vessels and rafts equipped with sails had been engaged in traffic between Vermont, New York and Canada since 1791 and earlier, great changes also came about; but they were different from those in the Connecticut valley because of the adaptability of the lake to steam navigation. The steamboat *Vermont* of 1809, like all first comers, brought but a hint of the future possibilities of the new art. Its slow speed of five or six miles per hour in its journeys between Whitehall, New York and St. Johns, Quebec, gave to it little eclat; fourteen years were to elapse before perfections in design and an increase in the number of the new craft made steamboating on the lake an established system in 1823. Then too it was in that year that the Champlain branch of the Erie Canal was completed, thus giving to the region a con-

tinuous water outlet southward to the port of New York and intervening points in competition with the ancient one leading north to Canada. Leading up to this momentous change, advances in the new art had been brought about by the Lake Champlain Steamboat Company which was chartered by New York State in 1813 and ceased to exist in 1833. The lake during this period became thickly dotted with sails, increased as they were with the advent of canal boats and barges so equipped, though the sailing vessel as such gradually fell off in number after 1841.

The year 1826 was one to be remembered on the lake for then it was that the Champlain Transportation Company, chartered in Vermont, was given life destined to last for 106 years, until railroad and motor competition gave it the quietus. After gaining possession in 1835, of the St. Albans Steamboat Company and the Champlain Ferry Company, until then competitors on the lake, it came under the control, after 1856, of interests affiliated with railroads later acquired by the Delaware and Hudson Company, which did not complete its rail line along the lake's western shore until 1875-76. It weathered the storm so long because of the popularity of that kind of travel for passengers won by the charm of the lake and surrounding mountains. During its existence of more than a century it was engaged not alone in passenger and freight service, but also in cross-lake ferrying and towing operations. Of the high quality of its passenger service there is the testimony of Charles Dickens who in 1842 spoke in the warmest terms of his experiences on the *Burlington* in journeying from St. Johns to Whitehall.

A year after rail communications were opened between Whitehall and Troy (on the Hudson River) in 1848, putting an end to the use of packets for passenger travel on the Champlain Canal and to stagecoach operation which for years had been the only means of conveyance to and from points south of Whitehall, joint through rail-and-water service for passengers and freight on what was known as the "North and South Through Line" was established whereby passengers for the first time were enabled to purchase tickets and check baggage directly between Montreal and New York and intermediate points, including those in Vermont. In 1851 the northerly terminus of the steamboat company was changed from St. Johns, Quebec, to Rouses Point, New York, in order to connect with newly completed railroads in Vermont and New York, and in 1876 to Plattsburgh for connection with the newly completed service over the New York and Canada Railroad to Montreal. The southerly terminus was changed from Whitehall to Fort Ticonderoga in 1875.

Water communications by steam within the state were confined to Otter Creek between its mouth and Vergennes, a distance of about 8 miles. A stretch of 24 or 25 miles above there was utilized by canal boats towed by animals along the bank between Middlebury and Pittsford; no such sluggish waters suitable for a similar purpose were to be found elsewhere in the state's interior.

The "canal mania" in New England, to which reference has been made, had its counterpart in Canada, but there with totally different results which had their repercussions in Vermont. Realizing their need for doing something to meet competition for western traffic on the opening of the Erie Canal, and for trade with New York and Vermont via the Lake Champlain route when the Champlain Canal should be opened, Canadians proceeded to develop and improve canals along the St. Lawrence River until by 1850 a nine-foot minimum draft channel had been made available for steamers and sailing vessels from tidewater at Montreal to Lake Ontario; also at Welland Canal when deepened to the same draft around Niagara Falls, and on the Richelieu River at St. Ours Lock and at Chambly Canal at which a 6 $\frac{1}{4}$ -foot draft was established. Beyond the Lake Erie entrance to the Welland Canal, navigation on the Great Lakes was unimpeded as far as the entry to Lake Superior at Sault Ste. Marie for such craft as could pass through the channels thus created by the Canadians; it was not until 1855 that the completion of the American canal at the latter point removed that limitation.

All this had an important bearing on the transportation situation in Vermont. In the early years after the American Revolution the Lake Champlain—Richelieu River route, then the principal one between New York and Canada in winter, was viewed as the easiest cross-border approach to Vermont and its neighboring states. It was even proposed by citizens on both sides, after the peace of 1783, that the Green Mountain State, because of its situation in the St. Lawrence valley, should become a part of Canada. As time went on the depletion of Vermont's available forests, as previously related, brought about the gradual stoppage in the 1840's of the northbound movement of rafts of logs carrying merchandise, and this, coupled with the effects of the Champlain Canal opened in 1823, resulted in the improvement of the Richelieu River by the Canadians, with little beneficial results to them however. By the importation from Canada of logs and timber, Burlington held and advanced its position as a prosperous emporium and lumber market, backed as it was too by a rich agricultural hinterland.

Another outstanding feature of the interplay of traffic in which the Canadian canals played their part, was the encouragement given Vermonters, and for that matter all New England, that access to the West by a combination of rail and water communications thus made possible north of the Adirondacks *massif*, would be afforded regions badly in need of relief from what were considered to be the exactions of the more direct Erie Canal and New York Central Railroad routes through New York State, opened in 1825 and 1842 respectively. Unfortunately for New England it was not realized, until long after, that the constantly increasing drafts of steamers on the Great Lakes west of Buffalo, not possible east of there by reason of the Welland Canal limitation, would bring disappointment to the progenitors of ambitious schemes in the 1840's for making Ogdensburgh a point of transshipment for freight and passengers, between the dreamed of rail carriers to be built north-

westward from Boston, and steamers operating on the Great Lakes as far west as Lakes Huron and Michigan and ultimately Lake Superior.

While these changes were taking place on Lake Champlain and the Connecticut River, transportation on land was undergoing some improvement, though unattended by the use of steam until the end of the fifty-year transition period in 1849-51. Beginning in 1799 some 91 toll-road turnpikes and plankroad companies were chartered in Vermont, of which thirty or so were actually put in operation. Of these the Green Mountain Turnpike was among the first, extending westerly from the bridge built in 1785 over the Connecticut River at Bellows Falls to a connection with the north-and-south public highway on the western side of the state leading through Rutland and Vergennes to Burlington and beyond. Another connected Brattleboro with Bennington, joining there with public highways leading north and south, and also southwesterly toward Troy and Albany.

Turnpikes no less important were those connecting White River Junction and the bridge built in 1796 over the Connecticut at Windsor with points in the Ottaquechee and White River valleys and thence to Middlebury and beyond; also those extending from Norwich on the Connecticut River opposite Hanover, New Hampshire, to Montpelier where connection was made with the public highway to Burlington from which a turnpike diverged at Waterbury for Mt. Mansfield and Hyde Park. From Newbury on the Connecticut River to Danville the route was turnpiked, as were many others including those from Fairhaven on the Poultney River to Bridport, joining there the public highway along Lake Champlain through Vergennes to Burlington and the Canadian border.

Also stretches were turnpiked along the Connecticut River from Bellows Falls to a point north of Norwich; sections here and there on the highway between Bennington and Rutland; a link between Sumner's Ferry on the Connecticut River in the town of Weathersfield and the Green Mountain Turnpike in the town of Cavendish; a route connecting the north-and-south highway at Newfane with the road through Stratton; and a few other links in the highway system of the state shown on Figure 7, such as the one between Peru and Manchester. In the closing years of the transition period, planks instead of macadam were used in some degree on the wearing surface, as between Waterbury and Hyde Park, Vergennes and Bristol and in places between Brattleboro and Bennington. They were much more perishable than the macadamizing used on the better built turnpikes.

With the passage of time toll collections became so unpopular, and the maintenance of the turnpikes so poor, that the companies were persuaded to transfer their holdings to the various towns and give up their charters, so that today, with an exception or two, there are no charges other than at two bridges over the Lake Champlain and one over the Connecticut. Free bridges over the latter now number thirty, in contrast with the two that collected tolls prior to 1800, five in 1806 and twenty in 1842.

In addition to the turnpiking of many of the state's highway routes, new roads were added to the system, of which a notable one, opened in 1815, extended from a connection with the Connecticut River highway in Ryegate through Barnet, St. Johnsbury, Lyndon, Wheelock and Sheffield to Barton where a junction was made with a road from Montpelier, and thence through Brownington and Derby to the Canadian line. In the same year a second important road was opened, said like the other to have been turnpiked, from Newbury along the Connecticut River to Brunswick, and thence through Brighton and Morgan to Holland where a connection was made with a highway in Stanstead beyond the border.

By this time the state's highway pattern had assumed very much the form it has today, tributaries of course having been later added as the population grew in size, especially in the northern section last to become settled. Over the principal routes in the open season passed great herds of beef cattle and sheep on the hoof, as well as stagecoaches drawn by two or more teams of horses in and across the state, and carts and large wagons hauled by teams of oxen or horses bearing the produce of the country destined in large part for the seaports of Boston, Portsmouth and Portland on the New England coast and for Troy and Albany on the Hudson. In the winter season sleighs and sleds were substituted for the wheeled vehicles carrying produce as well as frozen carcasses of swine and other animals when walking them to market was out of the question. The highways in time became sufficiently good to enable the larger marketing centers to draw on the country for long distances, as for instance Burlington which thus tapped the increasingly fruitful northern counties and centers of importance as far off as Northfield, St. Johnsbury, Hyde Park, Derby Line and points in Canada. From without the state the pull for its trade from New York, Montreal, Hartford and Boston grew in intensity, in particular Boston, which had no water communication with Vermont and therefore had to depend for that purpose on highways overland. In 1840 the "Hub" was successful in winning to itself the ocean terminus of the newly organized trans-Atlantic Cunard Line, and convinced that something equally farsighted for its protection must be done on land, not only fostered the Western Railroad completed to Albany in 1841, but also backed the scheme for connecting its port with the West via Vermont and the Lake Champlain gateway. Highways were seen to be no longer suited for economical long distance haul and travel.

It should be here mentioned that it was not alone in road improvement that travel in the open season on the principal public highways and turnpikes was gradually made more endurable and even fairly comfortable. The springless stage gave way to the egg-shaped coach introduced in 1806 and much improved by 1818, followed in 1828 by the world-famed Concord coach. From two to six horse teams, in relays, gave quick service for the times. Private travel had at its disposal the chariot, phaeton, gig, landau and chaise. Freight was moved in covered wagons hauled by from two to ten horse teams, which had not much room for change for

the better other than in capacity and design in some degree. The improvement of free-wheeled vehicles of all kinds by the 1840's had about reached its limit. They had well served their part under most difficult circumstances, as feeders and distributors in connection with water carriers on the Connecticut River, Lake Champlain and Otter Creek, as means of reaching out-state far distant markets and sources of supply, and as instruments in the development of the state's agricultural and timber resources. The time was now ripe for something different.

The end of the first half century, therefore, had brought to a close the era of primitive land transport in Vermont, insofar as its means of propulsion were concerned, as had long since taken place on Lake Champlain. The commencement of the decline in the state's sheep industry, the let-up in its growth of population, and the depletion of its available forests, all pointed to a pressing need for a newly developed means of land transport, the railroad, to make possible the development of the region's quarries of marble, slate and granite, then largely fallow, and to encourage manufacturing enterprise. Archaic means had become outmoded; a chance, it was felt, must be taken with modern transport, even though its blessings might be accompanied by misfortune. Boston in its extremity, too, was looking to Vermont for a new gateway to the rising empire in the West. Manifest destiny then inspiring the American people was not to be denied.

Bibliographical References: Nos. 1, 2, 4, 12, 13, 16-19, 21, 26, 27, 32, 34-36, 42, 50, 51, 54, 57, 59-61, 69-71, 78, 80, 90-92, 99.

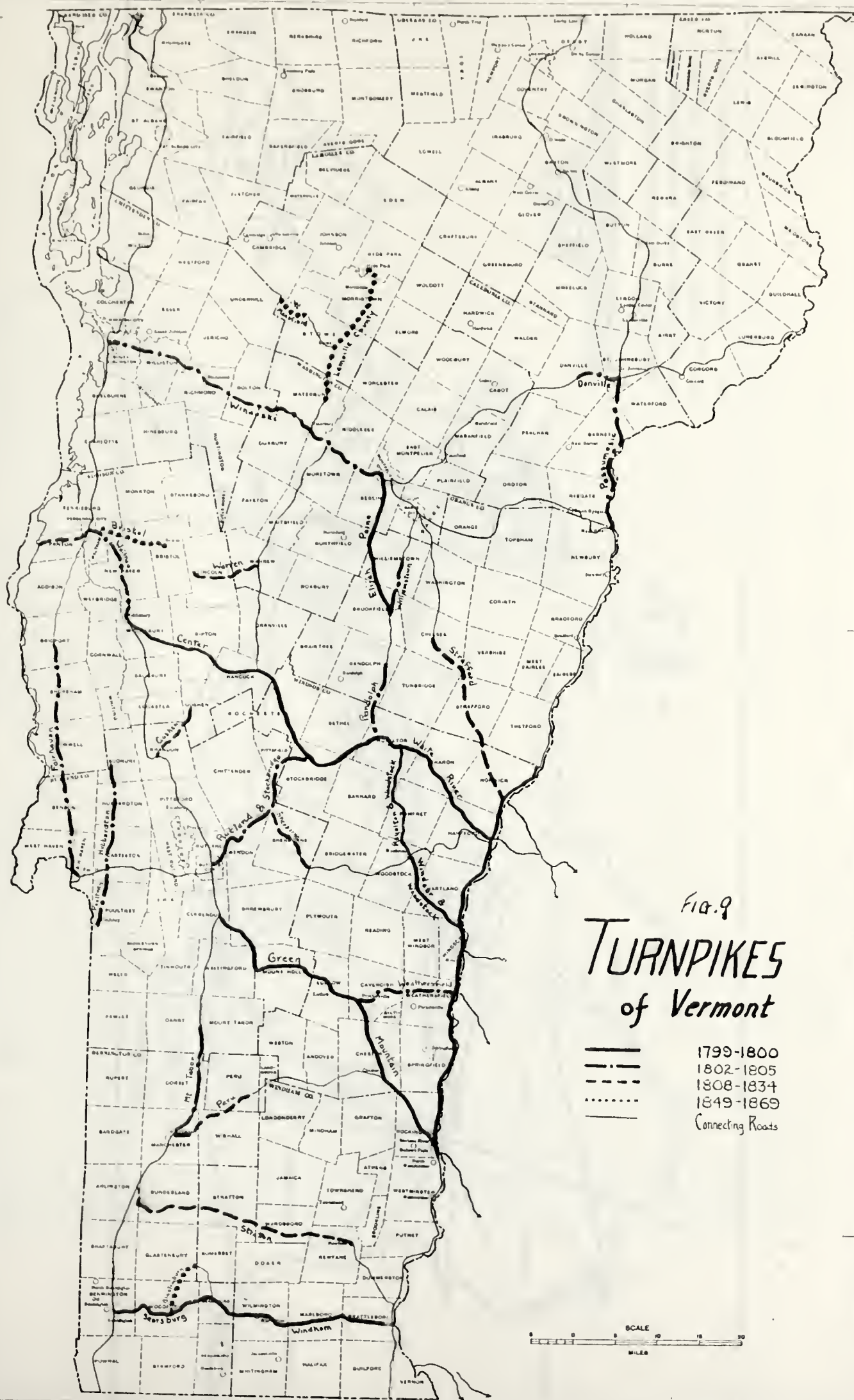
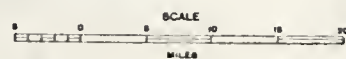
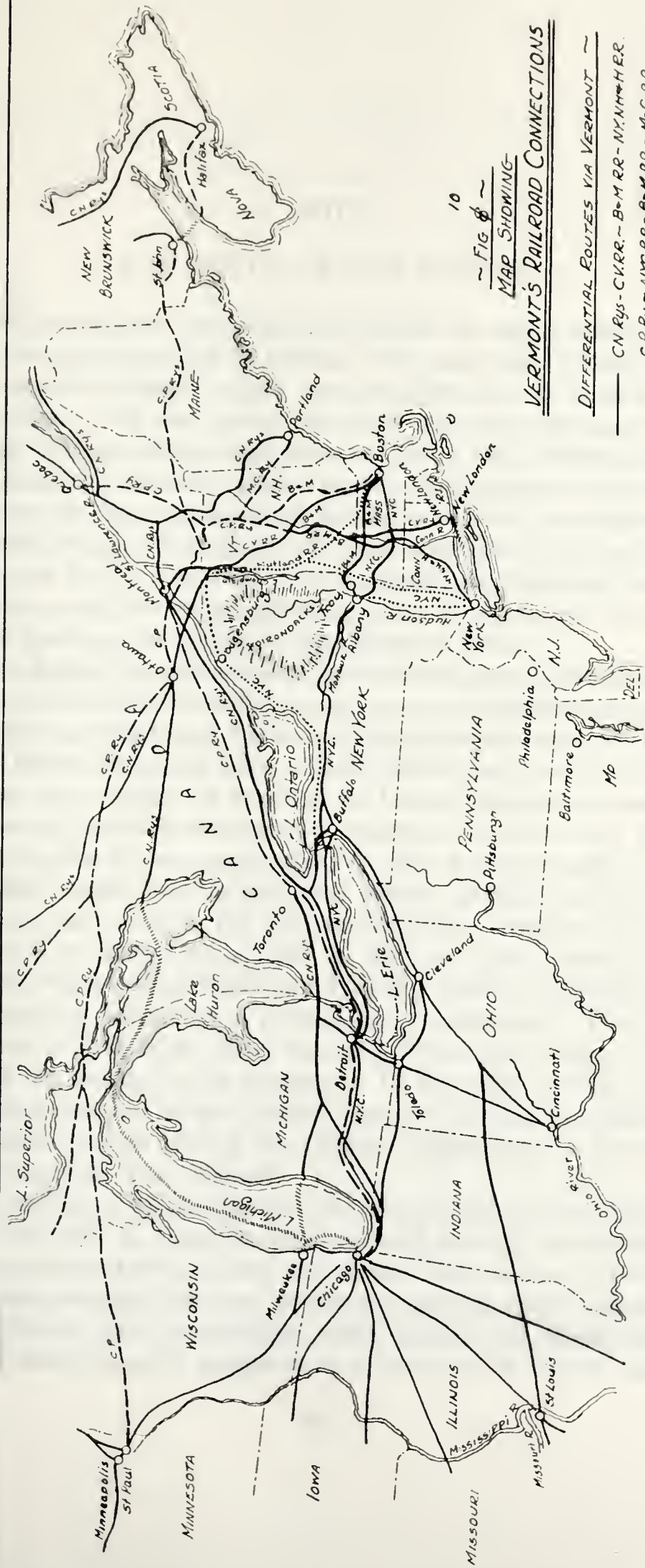


Fig. 9
TURNPIKES
 of Vermont

- 1799-1800
- - - - - 1802-1805
- . - . - 1808-1834
- 1849-1869
- Connecting Roads





~ FIG 8 ~
MAP SHOWING

VERMONT'S RAILROAD CONNECTIONS

- DIFFERENTIAL ROUTES VIA VERMONT
- CN Ry. - C.V.R.R. - B.M. RR. - N.Y.N.H. & H.R.R.
 - - - C.P. Ry. - N.Y.C. RR. - B.M. RR. - M.C. R.R.
 - C.N. Ry. - Ruri. and RR. - B.M. RR. - N.Y.C. R.R.

VIII

RAILROADS IN THE MAKING

ALTHOUGH among the foremost in the world to adopt steam propulsion on water, Vermont on land fell far behind. Not until nearly forty years after the coming of its first steamboat in 1809 was the locomotive in 1848 to come to life within its borders. This was seventeen years after the opening of New York's pioneer railroad between Albany and Schenectady in 1831, thirteen years after the building of Massachusetts' three railroad prongs radiating from Boston in 1835, and seven years after the Western Railroad had been finished from Boston to Albany in 1841. In fact Canada was earlier in the field, with the building of its Champlain and St. Lawrence Railroad in 1836 from Laprairie on the south bank of the St. Lawrence River, some few miles upstream from Montreal, to the foot of Lake Champlain navigation at St. Johns on the Richelieu River.

Although a laggard in performance for so many years, Vermont is to be credited with marked leadership in early moves for connecting Boston by rail with the foot of navigation on the Great Lakes at Ogdensburgh on the St. Lawrence and with Montreal farther down the river. These visions came true in 1851 when train service was thus first established between the United States and Canada.

It is interesting to follow the series of events in the 1830's and 1840's that led up to this culmination of strenuous efforts in New England itself to tap the vast Mississippi Valley traffic flowing east over routes serving rival interests on the Atlantic seaboard and south to the Gulf through New Orleans. The idea had its birth in the minds of many men as early as 1829 and 1830, among them two Vermonters, Charles Paine of Northfield and Timothy Follett of Burlington, who were fated later to become presidents of rival railroad enterprises. Their aim was not only the creation of a through route, termed a "National Railway", but also the development of the country to be traversed. In the course of time these stirrings had their ultimate outcome in the Central Vermont Railway and Rutland Railroad which as differential routes offering low through freight rates on west bound traffic have meant so much to New England.

With this outline in mind, attention may be turned to the origin and growth of the many railroads in Vermont which passed through countless vicissitudes before they reached maturity at the end of the 19th century. Built at first in separately owned sections, the more important ones in time were expanded and combined and then in part unscrambled, while many of the smaller ones were absorbed by their more powerful neighbors or abandoned for lack of traffic. In this

process the two great railroad systems beyond the border, the Canadian National and the Canadian Pacific, gained means of entry to the New England states and to the warm water ports of Portland, Boston and New York, the former through ownership of the Central Vermont and Grand Trunk railways and the latter by means of a lease of a portion of the Boston and Maine System. For a time, too, one of Vermont's important lines, the Rutland Railroad, came under the influence of the New Haven and New York Central roads.

Thus it was that the Green Mountain State with the coming of the railroad again became a thoroughfare, a bridge for interregional communication, quite as it had been in pre-Revolutionary days. The change from primitive means of transport to steam in both the United States and Canada; the expansion in 1845 of the drawback privilege on imported merchandise moving through one country to the other; the provisions made in the Reciprocity Treaty of 1854, and in the Warehouse Act of that year, for the unrestricted use in common of the Great Lakes and St. Lawrence River and lessening of cross-border restrictions through the broadened use of the bonding privilege and otherwise, followed in 1903 by a provision for the free use of the canals; the turn of tide of Mississippi Valley traffic northeastward coupled with outpourings from the Great Lakes Basin and Pacific Coast; and the steady growth of friendly relations and interdependence fostering international trade—all these, as illustrated on the accompanying map (Fig. 10), made of Vermont in truth a keystone in the northern arch of transportation between East and West of which mention has been made at the outset of this article.

Central Vermont—Canadian National Railways

Taking up the railroads of Vermont in detail, we should devote first attention to what is now known as the Central Vermont Railway, Inc. shown in red on the map of the state's railroads.* Its parent section, the Vermont Central Railroad, chartered in 1843 after earlier moves in the same direction in 1832 and 1835 had come to grief, was planned to follow the fertile valleys of the Connecticut, White and Winooski Rivers from Windsor to Burlington. The finally adopted location crossed the Height of Land in the town of Roxbury and by-passing the Barre region rich in granite, intended to be reached by spur, passed easily through the cleft in the Green Mountains in the town of Bolton. Its companion link in the intended great trunk line between Boston and Chicago, named the Vermont and Canada

*It is extremely important to bring together this material outlining the growth of the state's railway system, for without a grasp of it, one cannot understand the economic and social changes which accompanied the expansion of the railroads. Yet the passages themselves do not make for easy reading, unless the reader is enabled to *visualize* that growth as it occurred. Reference should be made to the map showing the growth of the railway network on the facing page. But the reader should also spread out at his elbow the large map of *Railroads of Vermont* (which has been folded into a pocket in the back of the book) and refer constantly to it while following the text.—*Editor*.

Railroad, was chartered in 1845 and organized in 1847 with John Smith of St. Albans as its president, to build an extension from Essex Junction to Rouses Point on the New York side of Lake Champlain. Completed in 1851, the joining of the two links in such a manner as to leave Burlington on one side gave cause for wonder and public discontent.

At this time Charles Paine, first president of the Vermont Central and twice governor of the state, was also a director of the Northern Railroad of New York to be constructed from Ogdensburgh to Rouses Point where junctions were to be made with both the Vermont and Canada and the Champlain and St. Lawrence Railroad extended there from St. Johns. By the fall of 1851 the four separately owned links were in operation from Ogdensburgh and Montreal to White River Junction where connection was made with the completed chain of independently owned links extending via Concord in New Hampshire to Boston; also to Windsor where a junction was made with another series of separately owned links extending southward through New Hampshire to Bellows Falls, Vermont, and thence south along the Connecticut River to Springfield, Massachusetts, and eastward via Fitchburg to Boston.

Previous to the completion of the through route, the Vermont Central on December 31, 1849, had opened its line to the Winooski River at Burlington. Its initial section from White River Junction to Bethel had been traversed on June 26, 1848 by the first train drawn by a locomotive in Vermont. This event, though inconspicuous, was as historic as the three-day "Jubilee" held in Boston on September 17-19, 1851 in honor of the running of the first international train between the St. Lawrence River at Montreal and Boston, an occasion marked by the presence of the President of the United States, Millard Fillmore, the Governor General of Canada, Lord Elgin, Daniel Webster, and many other dignitaries from both countries. Not the least of the causes for these felicitations, from Vermont's standpoint, was the gateway furnished by the Northern Railroad at Ogdensburgh for forest products originating on the railroad in Canada newly built northward from Prescott on the other side of the St. Lawrence toward Ottawa. These importations were sorely needed at Burlington and other Lake Champlain points where the local supply of logs and timber had practically reached an end.

There, too, was the promise of great things to come within the decade. The Grand Trunk Railway (now Canadian National Railways) by 1853 was to have its line completed from the warm water port of Portland, Maine, across the northeast corner of Vermont to Montreal, and thence on west to reach the St. Clair River outlet of Lake Huron in the same year in which the great Victoria Bridge over the St. Lawrence River at Montreal was completed; 1859. On the Northern Railroad (of which the name was successively changed to the Ogdensburgh Railroad in 1857 and the Ogdensburgh and Lake Champlain Railroad in 1865) a connection was to be made, in the former year, with an extension of what in time became a part of

the Rome, Watertown and Ogdensburgh Railroad, ultimately absorbed by the New York Central system. At the Ogdensburgh terminus of the Northern Railroad connections with a fleet of Great Lakes steamers were in prospect, soon to be realized. In the Connecticut Valley the Connecticut and Passumpsic Rivers Railroad, northward from White River Junction, was in the making. On the East, therefore, the Vermont Central—Vermont and Canada group had in 1851 two outlets by rail to Boston, another via the Connecticut River Railroad toward New York, and still another pointing toward Quebec, while on the west it had in hand, or in sight, alternate outlets by both water and rail to points in New York, Canada and the Far West. Moreover it had connections at Rouses Point with the steamboat line of the Champlain Transportation Company, and a point of interchange at Burlington with its rival, the Rutland and Burlington Railroad, by means of which passengers with frequent changes of cars were carried in 1852 between Montreal and New York. It was not until 1863-64 that an extension was built from St. Albans to the international boundary, to be met there by the Montreal and Vermont Junction Railway constructed southward in its interest from St. Johns, thereby affording a more direct route to Montreal than the circuitous one through Rouses Point.

The outlook now was bright for close traffic relations between railroads so strategically located, but grave difficulties were encountered where transshipments of freight and the transfer of car-bodies were required at meeting points of standard gauge American equipment and that of the wider Grand Trunk gauge. Also the longer time consumed on shipments through Canada was a grave handicap in competition for western traffic with the more direct standard gauge all-American trunk lines, accentuated as it was by recurrent trunk line rate wars between the New York Central, Pennsylvania, Erie and Baltimore and Ohio Railroads and the Grand Trunk Railway of Canada. One of these difficulties was overcome in the mid-1870's when the Grand Trunk gauge was standardized; but the other remained in full force until by agreement between the warring systems the round-about route across mountainous Vermont was permitted to make lower rates than the others on certain freight, thereby giving rise to the term "differential." In one sense this was favorable to the Vermont roads in gaining for them traffic, but on the other hand at ruinously low rates coupled with costly operation which spelled insolvency. Local business, even at much higher rates, was unable to save the day. The development of granite industries and copper mines along the line came slowly and the strange by-passing of Montpelier and Burlington was the reverse of helpful. Still another cause for disappointment was the bar to passage eastward of Great Lakes deep draft vessels at the Welland Canal.

But this was not all. Litigation between Vermont Central and Vermont and Canada interests accompanied by receiverships almost from the start, and alleged incompetency, betrayals of trust, and other wrong doing on the part of officials

afflicted with divided loyalties, had their part in bringing heavy losses to their unfortunate investors. This was not so, however, in the case of the management, which throughout various trusteeships and receiverships appears to have remained in power and affluence. Trustees for the two parent companies in common, of whom J. Gregory Smith, twice governor of the state, was the moving spirit, continued in office from 1861 to 1873 when they gave way in name only to a new receiver, a freshly organized corporation known as the Central Vermont Railroad Company, which held sway until 1884. In that year the same company unchanged in dominance came into possession of the property as lessee, and so continued until 1896 when a new receivership ensued until 1899. From that sad experience the road emerged as the Central Vermont Railway controlled by the Grand Trunk Railway of Canada as an entrance to the heart of New England.

In the interval between 1861 and the century's close, not only was the extension added from St. Albans to St. Johns in ca. 1864, but also several branches in Canada since passed to a subsidiary, as well as the Rutland Railroad including the Ogdensburgh and Lake Champlain and its Great Lakes fleet in 1870 (lost through receivership in 1896 as will be explained later), the Missisquoi Valley Railroad from St. Albans to Richford in 1873 and still in its possession, the Burlington and Lamoille Valley Railroad from Essex Junction to Cambridge Junction opened in 1877 and abandoned in 1938, the West River Railroad in 1880* and given up in 1929, and the through route to New York City†.

The year 1897 was marked by the construction of the connection of the Canada Atlantic Railway (now Canadian National Railways) with the Central Vermont at Alburgh Junction, known as the Vermont and Province Line Railroad, thereby affording another gateway on Vermont's northern border. The century, therefore, was rounded out by the Central Vermont's possession of a system connecting Canada and New England in the main as it exists today controlled by interests beyond the border.

Although of little moment in the development of Vermont, the route of the Grand Trunk Railway across its northeastern corner holds much interest. Promoted in 1843 by the foresighted and energetic John A. Poor of Portland, Maine, in behalf of that port's aspiration for an independent rail connection with the West, it came to life under his sponsorship and that of leading citizens on the north, when the Atlantic and St. Lawrence Railroad from Portland and the St. Lawrence and Atlantic Railway from Montreal met at Island Pond, Vermont, in 1853. Thereupon the companion roads were absorbed by the Grand Trunk which was in turn included in the Canadian National Railways system.

*Then the Brattleboro and Whitehall R. R., leased to the New London Northern R. R. in 1880.

†Acquired first through lease and then by means of trackage rights from Windsor to Brattleboro, and thence by agreement in 1871 and later by lease of the New London Northern Railroad to New London, Connecticut, and beyond by fleet on Long Island Sound to New York.

Rutland Railroad

The Central Vermont was not alone in railroad pioneering in the 1840's. As has been mentioned, Charles Paine had a companion spirit in Timothy Follett whose ideas turned toward a rival project planned to run from Burlington southward along the fruitful shores of Lake Champlain and up the valley of Otter Creek, rich in marble, to a low crossing of the Green Mountains in the town of Mount Holly, and thence down the Black and Williams River valleys to Bellows Falls where outlets were contemplated via Fitchburg to Boston, as well as down the Connecticut River in the same manner as the Vermont Central. Chartered in 1843 as the Champlain and Connecticut River Railroad, its name was changed in 1847 to the Rutland and Burlington Railroad, and again changed as a result of foreclosure proceedings to its present name, the Rutland Railroad, in 1867. As in the case of its competitor, its career in finance was disastrous to its investors from start to finish as soon evidenced by its bankruptcy in 1853, though happily unattended—it would appear—by the same gross misdoings.

The completion of the Rutland and Burlington Railroad from Bellows Falls to Burlington on December 18, 1849, two weeks ahead of the arrival there of the Vermont Central's first train, was succeeded by an equally historic event when a daily passenger train service over this route was inaugurated on May 15, 1852 between New York and Montreal via the Hudson River, Troy and Boston, Troy and Rutland, Rutland and Washington, Rutland and Burlington, Vermont Central, Vermont and Canada, and Champlain and St. Lawrence Railroads, only eight months after rail communication for the first time had been established between Montreal and Boston. An embarrassing situation, however, had meantime developed. The neglect or refusal of the Vermont Central to make with it a suitable rail connection at Burlington compelled the Rutland and Burlington to resort to ferriage from Burlington to Rouses Point in the open season, and to sleighs in winter, the control of the Champlain Transportation Company for better serving this purpose having been secured on August 31, 1852 but given up in 1854-55. Evils attending that predicament were enhanced by the Northern Railroad's partiality for traffic interchanges with the Vermont Central at Rouses Point, as a result of which the Rutland company changed its cross-lake terminus from that point to Plattsburgh in New York, and through friendly interests brought about the construction of a railroad from there to Moore's Junction on the Northern Railroad and beyond to the international border where contact on September 20, 1852 was made with a newly built rival of the Champlain and St. Lawrence Railroad for access to Montreal. In spite of these measures the Rutland company from a competitive standpoint remained bottled up at Burlington until its route, under the name of the Rutland-Canadian Railroad leased in 1899 and absorbed in 1901, was extended in 1898-9 from island to island in Lake Champlain to Alburgh and thence

over the leased Rutland and Noyan Junction Railway to a connection with the Quebec, Montreal and Southern Railway at Noyan Junction, Quebec. Since then the latter connection has been changed to one traversing the Central Vermont bridge over Lake Champlain to Rouses Point and thence over the Canadian National Railways to Montreal.

At the other end of its route the Rutland company made a connection with the Vermont Valley Railroad opened from Bellows Falls to Brattleboro in 1851, beyond which the Vermont and Massachusetts Railroad opened in 1849 gave an outlet to the south and east. The former of these two roads was leased by the Rutland company in 1865 and the latter between Millers Falls and Brattleboro in 1870, eventually disposed of to the Boston and Maine as will be explained later.

An alternate route from Bellows Falls to Boston was afforded in 1850 via the Cheshire Railroad through Keene, New Hampshire. Two other outlets also were secured, one by means of a connection made at Rutland in 1852 with the Rutland and Washington Railroad, now the Delaware and Hudson, having access to Albany and Troy and thence to New York reached by the Hudson River Railroad in 1851; the other by means of a connection at Rutland with the Western Vermont Railroad* extending through the marble district along Otter Creek and headwaters of tributaries of the Hudson River to a junction in 1853 with the Troy and Boston Railroad, now the Boston and Maine at White Creek, New York, for access to Troy and Albany and beyond. These main stems had been in use some seventeen years when control of the Addison Railroad was secured in 1870 and a branch built in 1871 from Leicester Junction westerly across Lake Champlain to Addison Junction (Ticonderoga) whence the Whitehall and Plattsburgh Railroad leased by the Rutland Company led northerly to the Port Henry iron mines sixteen miles away on the New York side of Lake Champlain. The continuation of the Whitehall and Plattsburgh northerly to Plattsburgh was in contemplation with a view to hooking up with the Montreal and Plattsburgh, the successor to the long since controlled Plattsburgh and Montreal Railroad, thus promising through rail movements in New York State for the Rutland company's rail traffic bottled up at Burlington from the start.

Alarmed by this threat to its monopoly on all-rail shipments through the

*The Western Vermont Railroad, opened for traffic between Rutland and Bennington in 1852, was changed in name to the Bennington and Rutland in 1867. From 1859 to 1867 it was in the possession of the Troy and Boston Railroad, under lease, when Central Vermont interests gained control. In 1869 it leased the Lebanon Springs Railroad between Bennington and Chatham, N. Y., with which it was consolidated in 1870 under the name of the Harlem Extension Railroad. The lease of the latter passed to the Vermont Central Railroad in 1873. The latter abandoned the lease in 1877, and the Vermont portion was taken over by a reorganized Bennington and Rutland Railroad. The portion in Massachusetts and New York was taken over for operation by the "Harlem Extension Railroad South, Coal Transportation Company." In 1900-01 both portions of the old Harlem Extension were brought under control of the Rutland Railroad as hereinafter mentioned.

Lake Champlain gateway, the Vermont Central—Vermont and Canada group in 1870 bought control of the Rutland company and at the same time leased the Ogdensburgh and Lake Champlain, thereby joining rivals which had been at each others' throats for more than twenty years, and destined to remain so united until severed twenty-six years later. It was in 1873 that the Central Vermont Railroad, as receiver, took over the duties of its predecessors who remained however in control. The Central Vermont's holding in the Whitehall and Plattsburgh and Montreal and Plattsburgh railroads were sold to New York interests acting for the newly organized New York and Canada Railroad (now the Delaware and Hudson railroad), which was opened for its full length along the west side of Lake Champlain from Whitehall to Rouses Point and thence to Montreal in 1875-76. Not until 1920 was the Rutland company's cross-lake connection discontinued between Larrabee's Point and Addison Junction.

At the rounding out of the century the Rutland company (again become independent in 1896 and in possession of the Ogdensburgh and Lake Champlain Railroad and its Great Lakes fleet in 1899) sought full control of the Bennington and Rutland Railroad and also of the Chatham and Lebanon Valley Railroad (long since leased under the name of the Harlem Extension) connecting its Bennington terminus with the northern terminus of the New York Central's Harlem Division at Chatham, New York, and in 1900-01 brought both deals to a conclusion.

It will be seen that the Rutland Railroad system, illustrated on Figure 14, had a half-century's career as complex as that of the Central Vermont or nearly so. Its financial disappointments and its dependence on foreign traffic during its years of growth were of the same order, as were their causes and outcome very much the same. What happened to it in later years will be touched on in the next chapter.

Boston and Maine and Maine Central Railroads

The line operated by the Boston and Maine Railroad and its subsidiaries in eastern Vermont since 1887 and 1893 had its start in the Vermont and Massachusetts Railroad built northerly to Brattleboro in 1849, and sold in 1880 to the New London Northern Railroad then leased to the Central Vermont Railroad. The arrangement made with the latter for trackage was supplemented in 1913 by the building of the Boston and Maine's independent line used in conjunction with the Central Vermont's link between East Northfield, Massachusetts and Brattleboro as a double track. The next in order, the Vermont Valley Railroad, opened in 1851, ultimately came under the control of the Boston and Maine through stock ownership and lease, as did the Sullivan (County) Railroad opened in 1849 from Bellows Falls through New Hampshire to Windsor. Trackage over the Central Vermont that had been opened from Windsor to White River Junction in 1849 came next, and then control of the Connecticut and Passumpsic Rivers Railroad, which had

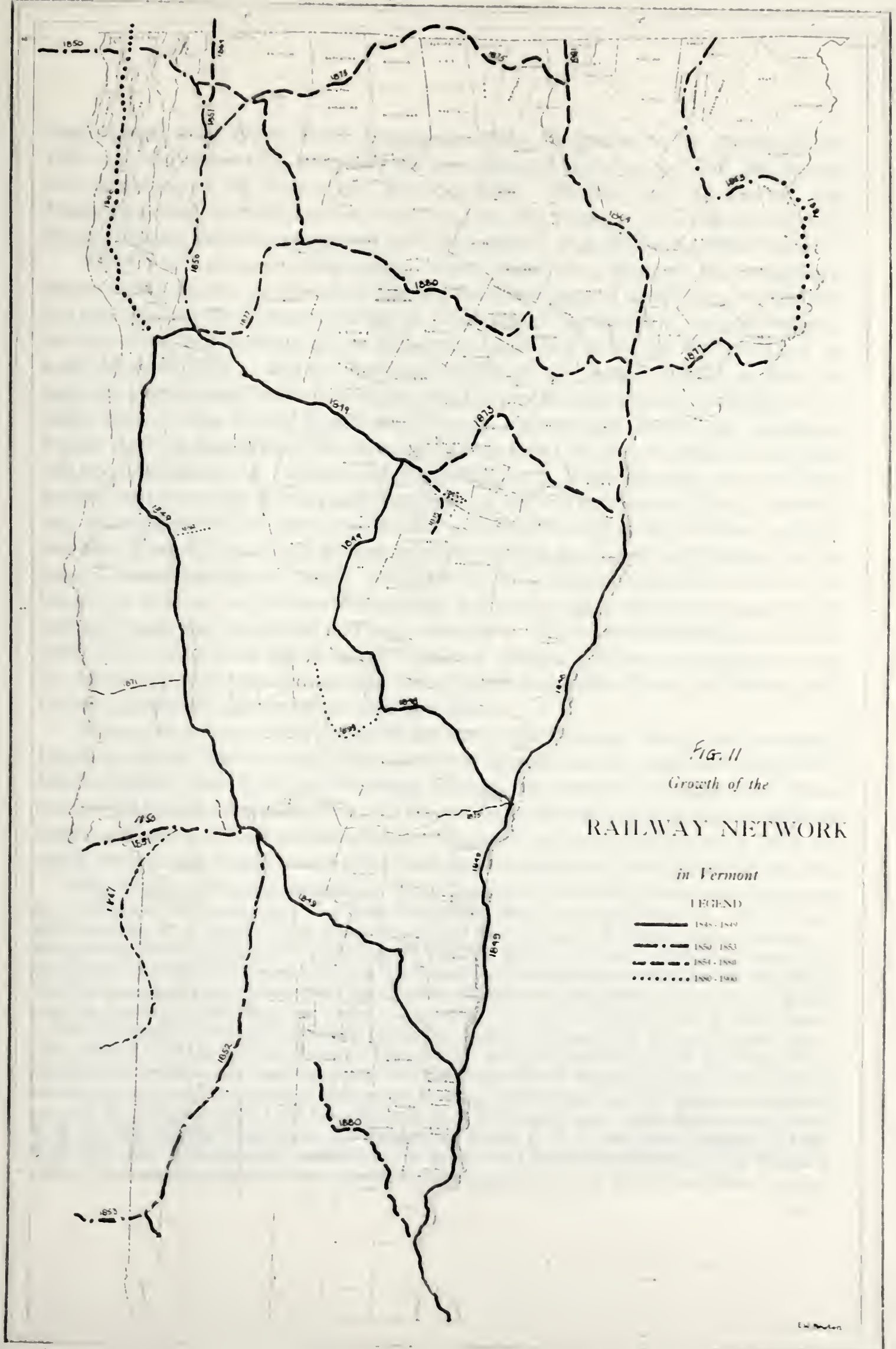


FIG. 11
Growth of the
RAILWAY NETWORK
in Vermont

LEGEND
 ————— 1845 - 1849
 - · - · - 1850 - 1853
 - - - - 1854 - 1880
 · · · · · 1880 - 1900

been started from White River Junction in 1848, completed to St. Johnsbury in 1850, to Newport in 1863-64 and to the international boundary in 1867, and leased to a subsidiary of the Boston and Maine in 1887. Beyond there, in Canada, the Massawippi Valley Railway was leased in 1870 for access to Lennoxville, beyond which trackage rights were secured over the Grand Trunk Railway to Sherbrooke.*

Within a little more than twenty years, therefore, a chain of five separately owned railroads, four of them in Vermont, had been created from Vermont's southern border along the Connecticut River to Barnet at the mouth of the Passumpsic, up that river to a crossing of the Height of Land and down the Barton River to Lake Memphremagog and the northern border of the state. United in time by trackage rights, lease and ownership, they became an important thoroughfare for traffic between the United States and Canada, in particular that of the Canadian Pacific Railway to and from Montreal and Quebec and beyond, of which an account will be given farther on. Connected with this spine in Vermont were, and are, lines leading on the east to Boston and Portland, on the west to Rouses Point, Burlington, Montpelier and Rutland, and on the south to New York and various ports in southern New England, in addition to points on its own route and beyond in the lower Connecticut River valley. Although not so intended in the first instance, it became in time an artery for international traffic, its valley location gifting it with comparatively low gradients, and easy curvature. Since 1926 its holdings north of Wells River have been leased to the Canadian Pacific, and its management of the St. Johnsbury and Lake Champlain, Montpelier and Wells River, and Barre and Chelsea Railroads transferred to local interests.

Across the southwestern corner of the state runs the main line of the Fitchburg Division of the Boston and Maine between Boston on the east and Troy and Mechanicville, New York, on the west, crossing the system's Connecticut River line at Greenfield, Massachusetts. Of its two main tracks in Vermont, the present westbound one was built as the Southern Vermont Railroad and opened in 1859, on which date it was leased to the Troy and Boston Railroad, then leased in turn by

*The Boston and Maine's predecessor in the Connecticut River Valley was the Connecticut River Railroad built soon after 1846 from Springfield, Mass. to South Deerfield. It was soon after extended to a junction with the Vermont and Massachusetts Railroad project leading to Brattleboro, later incorporated in the Central Vermont System. From the Vermont State Line the Connecticut River Railroad extended northward in New Hampshire over the Ashuelot Railroad by lease to Keene, thence over the Cheshire Railroad to Brattleboro in Vermont, thence over the Vermont Valley Railroad under an operating contract to Bellows Falls in 1877, thence in New Hampshire over the financially controlled Sullivan (County)R. R. to Windsor, Vt. in 1880, thence over the Central Vermont Railroad by means of trackage rights to White River Junction, and thence over the Connecticut and Passumpsic River Railroad, by means of financial control, to the Canadian boundary and beyond in 1885, in which year a similar control was secured over the St. Johnsbury and Lake Champlain R. R. The latter passed to the Boston and Lowell R. R. in 1885 and the Connecticut and Passumpsic Rivers R. R. to the same company in 1887. Both then went with the other holdings of the Boston and Lowell to the Boston and Maine in 1887. The remainder of the Connecticut River Railroad passed to the Boston and Maine in 1893.

the Fitchburg Railroad in 1887 and the Boston and Maine in 1900 and absorbed by the latter in 1919. The other track, used for eastbound movements, was built in 1879 by the Boston, Hoosac Tunnel and Western Railroad Company of Vermont, which in 1892 was leased to the Fitchburg and so continued until 1900 when it passed to the Boston and Maine, as in the case of the westbound track.

The Maine Central Railroad, now under the same presidency as the Boston and Maine, is represented in Vermont by two branches, one with its terminus at St. Johnsbury and the other at Beecher Falls and both uniting at Quebec Junction in New Hampshire whence the road continues on to Portland. The former was built in 1872 and 1877 as a part of the Portland and Ogdensburg Railroad touched on below; the latter in four sections of which the lower of the two located in Vermont was built in 1890 by the Coos Valley Railroad and the other in 1888 by the Upper Coos Railroad of Vermont, and both leased to the Maine Central Railroad in 1890. The Upper Coos Railroad once continued as the Hereford Railway to Lime Ridge, Quebec, but this cross-border branch was abandoned by the Maine Central in 1925.

The present layout of both the Boston and Maine and Maine Central will be found on Figure 14.

Canadian Pacific Railway

This system in Vermont, shown on Figure 14, bulks rather small in mileage, but in character and volume of traffic it holds a prominent place. It was in 1881 that the Missisquoi and Clyde Rivers Railway, built in 1873-75 between Richford and Newport (and later as the Newport and Richford Railway, by then the property of the Connecticut and Passumpsic Rivers Railroad), was leased by the latter to the Montreal and Atlantic Railway, a subsidiary of the Canadian Pacific Railway. In this manner the Canadian company coming from Montreal was given direct contact in 1883 with the Connecticut and Passumpsic Rivers Railroad leading northward toward Quebec and southward toward Portland, Boston and New York and intermediate points.

It is to be added that the Midland Railroad of Vermont, built in 1911 in the interest of the Canadian Pacific from North Troy to the international boundary, formed a link in a branch in Canada extending to Windsor Mills. This has been abandoned since 1936.

As has been remarked, the Boston and Maine holdings north of Wells River were leased from that system in 1926. All in all, it is to be said that the Canadian Pacific Railway, in the manner here described, had in Vermont important pathways for international traffic through its Richford, North Troy and Derby Line gateways, akin to those of the Canadian National Railways through their Rouses Point, East Alburgh, Highgate and Norton gateways.

Delaware and Hudson Railroad

Known as the Delaware and Hudson Canal Company until 1899, and thereafter as the Delaware and Hudson Company, the rail holdings of that system in 1930 were conveyed to the Delaware and Hudson Railroad Corporation owning in Vermont the northerly portion of the branch between Salem, New York, and Rutland, and the easterly end of the line between Whitehall, New York, and Castleton on the foregoing branch. Their original purpose in the main, was the servicing of slate and marble quarries in that portion of the state and the establishment of a link in rail communication between New York and Montreal. Their history is of absorbing interest, not only because of their influence on the development of Vermont, but even more strikingly because of the part played by their parent system in the Lake Champlain valley as a whole.

It was in 1833 that the pioneer Saratoga and Schenectady Railroad was opened between Schenectady on the Mohawk River and Saratoga Springs, followed two years later by the independently built Rensselaer and Saratoga Railroad from a connection with it at Ballston to Troy. In conjunction with stagecoach and canal packet service between Saratoga Springs and Whitehall, and steamboat service on the Hudson River and Lake Champlain, a route was thus established which despite all later changes has ever held the palm for speed and shortness of distance between New York and Montreal. By 1848-51 the Saratoga and Washington Railroad had been opened from Saratoga to a direct connection with the Champlain Transportation Company line on Lake Champlain, including the establishment of the North-and-South Through Line of which mention has been made, matters of great moment to the people of Vermont who were at the same time witnessing the inauguration of all-rail service across their state between Montreal and Boston via Rouses Point.

While this was going on, action was not lacking in efforts by the rival cities of Albany and Troy to gain rail access to Vermont. By 1852 the Rutland and Washington Railroad had been opened from Rutland through the towns of Castleton, Poultney, Pawlet and Rupert, Vermont, to Salem, New York, where a connection was made with the Troy and Rutland leading thence over two routes to Troy and Albany; and by 1853, as has been mentioned, the Western Vermont had been connected with the Troy and Boston leading to the same points on the Hudson. Prior to this, in 1850, the Saratoga and Washington had been built from Whitehall to the Vermont line and thence the Rutland and Whitehall to a junction with the Rutland and Washington at Castleton. Certainly Rutland was doing well as the focal point of so many outlets by rail, just as was Burlington, even in a larger sense, through its two newly opened rail routes eastward, and the superior through and local boat service on Lake Champlain. A commentary on the value of these improved means of transportation, ultimately parts of the D. & H. system, was the

far lower freight rate from western Vermont to New York, on for instance such products as slate, than over the mountains to Boston by a much shorter course.

Farsighted moves also were made by enterprises which ultimately fell to the Delaware and Hudson. In 1865 the Rensselaer and Saratoga and its leased and merged lines effected favorable traffic arrangements with the Champlain Transportation Company and with the Rutland and Burlington Railroad and its northern and eastern connections; and in 1875-76 the New York and Canada was completed from Whitehall along the west side of Lake Champlain to Rouses Point, and thence by means of connections to Montreal, all as explained in the portion of this chapter dealing with the Central Vermont and Rutland Railroads. Vermont's region west of the Green Mountains and Height of Land reaped its share of the great benefits that sprang from these interstate improvements in transportation along its Lake Champlain border, as it did in a lesser degree from the new rail lines radiating from Rutland which had a more favorable outlet southward.

St. Johnsbury and Lake Champlain Railroad

In Portland's sharp rivalry with Boston, as instanced by the building of the line from there to Montreal across Vermont in 1853 (and taken over in that year by the Grand Trunk Railway of Canada), a plan was proposed for an independent line thence to the Pacific, in which the Portland and Ogdensburg Railroad extending across Vermont to Lake Champlain should be made a link. Connections by this means would also be effected with the Rensselaer and Saratoga—Champlain Transportation Company's north-and-south rail and boat lines, and with the Central Vermont leading to the foot of Great Lakes navigation at Ogdensburg.

Built over the Height of Land and as far as Cambridge Junction in 1877, the portion of the road west of the Connecticut River, known as the "Vermont Division", was purchased at foreclosure by the St. Johnsbury and Lake Champlain Railroad organized in 1880 to take it over. Through consolidations with existing stretches the new company had secured in that year a continuous route across the state to Lake Champlain and in 1884 a further extension gave it contact with the Central Vermont at Swanton. Owing to financial difficulties the Boston and Lowell Railroad, controlled by the Boston and Maine, assumed its management in 1885, and in 1912 the portion between the Connecticut River in Lunenburg and St. Johnsbury was leased to the Maine Central. Local management since 1925 has been in charge of operation of the remainder of the road, although the Boston and Maine still has in it a financial interest.

For many years this link in the chain between Chicago and the White Mountains, via the Rome, Watertown and Ogdensburg and Ogdensburg and Lake Champlain Railroads, was traversed by popular through palace car trains long since become a memory; for through freight traffic the line has failed to meet the expectations of its promoters, who saw in it a great future.

Minor Railroads

Of these the Montpelier and Wells River Railroad takes the lead in mileage. Chartered first in 1849 as "a railroad" from Montpelier to the Connecticut River, it was rechartered in 1867 under its present name and opened for service from Montpelier over the Height of Land to Wells River in 1873. By 1877 its financial failure led to a reorganization from which resulted its control by a subsidiary of the Boston and Maine Railroad. In 1913 the Barre Branch Railroad was absorbed and the Barre and Chelsea has been leased, while in 1926 the management of the road was taken over by the same interests that had taken similar action in the case of the St. Johnsbury and Lake Champlain Railroad. It was to aid in the development of the Barre granite industry that this was brought about.

Similarly the Clarendon and Pittsford Railroad was built in 1885-1887 to serve the marble industry centered at Rutland, and was expanded by purchase in 1911. In the southern part of the state the Deerfield River Company opened its narrow gauge railroad from Hoosac Tunnel on the Fitchburg Railroad to Readsboro in 1885, and in 1887 leased and then in 1891 sold the portion in Vermont to the Hoosac Tunnel and Wilmington Railroad. In the latter year the Deerfield Valley Railroad Company built an extension from Readsboro to Wilmington and promptly sold it to the Hoosac Tunnel and Wilmington Railroad which abandoned it in 1936. A fourth surviving minor railroad is the Boston and Maine controlled electric Springfield Terminal Railway organized in 1923 to take over the Springfield Electric Railway, which had been organized in 1894 primarily to serve the machine tool industry in Springfield, Vermont, and to make a junction with the Boston and Maine at Charlestown, N. H.

The lines remaining to be mentioned no longer live. The West River Railroad, originally organized in 1870, made a transfer of its rights to the Brattleboro and Whitehall Railroad, which built and leased it to the Central Vermont system in 1880, as a narrow gauge line between Brattleboro and South Londonderry. In 1905 it was transferred through foreclosure proceedings to a newly organized West River Railroad as nominal owner. It was subsequently broad gauged, but finally abandoned in 1938, after a long and unprosperous career. Another road to meet an unseemly end was the White River Railroad. This was built as the White River Valley Electric Railroad from Bethel to Gaysville in 1898-99 and, under the new name of White River Valley Railroad, completed to Rochester in 1900. After foreclosure in 1902 it changed its name to the White River Railroad and then in 1930 to the White River Railroad, Inc. Within three years of that time it was abandoned. The Woodstock Railroad, opened in 1875 between White River Junction and Woodstock, had its name changed later to the Woodstock Railway, long weathered the storm, but succumbed in 1931-33 to motor car competition and was abandoned. The Bristol Railroad between New Haven Junction and Bristol became a casualty in 1930, as did the Hardwick and Woodbury Railroad in 1934.

Many electric railways for local service have been built in the state, the one between Burlington and Winooski having been the first, in 1893. With the exception of the one at Springfield they have passed out of existence owing to automobile competition.

In general it is to be said that these minor roads found it possible to remain alive only where supported by ones more prosperous or where backed by industrial enterprise. Lumbering was too evanescent, and farming on too small a scale, alone to bear the cost of rail transportation, which is basically dependent for success on ample never failing traffic.

Summary

From this recital the conclusion may be drawn that, once come to life in the middle of the 19th Century, transportation by rail in Vermont quickly took on stature, until at the end of fifty years it had reached maturity. Rising to upward of 500 miles in 1855, its mileage had grown to more than twice that number by 1900. Wedged between Lake Champlain and the Adirondack Mountains on the west, and the Connecticut River valley and the White Mountains on the east, the State's open gateways on the north were inviting passageways for the newly devised means of land communication between the Mississippi Valley and Canada and the New England states seeking rescue from domination by New York's water-level route from Lake Erie to the Hudson River.

In consequence of this the primary purpose of Vermont's first railroads was to serve as links in a chain by rail and water transportation in part on Canadian soil. By these means the two great Canadian railway systems also gained access to New England and its warm water ports. In a word, Vermont was to fill out its destiny as a thoroughfare to which it was fated long before the coming of Samuel de Champlain.

Vermont thus played an historic part in the "battle of the waterways", in which the northeastern outlets of the Mississippi Valley, aided by the railroads after 1850, were victorious. The influence of its railroads, too, was made evident in the development of its meagre mineral resources and in the encouragement of industrial enterprise at the centers shown on Figure 3. This, however, did not help but on the contrary harmed the state's rural regions, their youths lured thereby to other states. Furthermore, they suffered from dislocations incident to the transfer of much of their population from inhospitable mountain sides to the more fertile, rail-occupied valleys. A glance at Figure 5 will explain much of this, as will a study of Figure 4, on which the rate of growth of population in the state is shown to have fallen off markedly after 1850. It was in some other direction than rail transportation that Vermont, after 1900, would have to look for relief from stagnation.

Bibliographical References: Nos. 5, 7, 9, 13, 15, 21, 23-25, 27-29, 31, 32, 36, 38, 39, 41, 42, 44, 45-47, 50-52, 53, 54, 56-61, 67, 68, 82-84, 86, 88, 91, 101.

IX

TWENTIETH CENTURY TRANSPORTATION

DURING the nineteenth century primitive means of transport came to an end on water, as they did on land, in the field served by rail; but on highways and in the air it was not until its close that the coming of the internal combustion engine marked the opening of a new epoch. A complete revolution in man's ancient manner of movement was in the offing. Thenceforth Vermont, as in the world at large, was to go through startling changes affecting society to its very depths. The motor car was destined to bring sorrow to the railroads, and the airplane to change the course of history. Increasingly it became quite apparent that all types of transportation, serving as they do a common purpose in the public interest, should be considered as a whole, even when giving attention to each of them by itself. Their intimate correlation is not to be ignored. With that in mind railways, highways, waterways, airways and pipelines in that order will be taken up in this study.

At the outset it should be mentioned that the coming of the internal combustion engine caused a revolution in transportation in more ways than one. Although railroads looked to the private investor in substantially all respects for needed capital, while highways (apart from their vehicles) were maintained from the public purse, this heretofore had given rise to little or no complaint on the part of the railroad, because the highway was not a rival but a friend—a beneficial short-haul feeder and distributor of traffic. Shortly the picture changed. The multiplying use of the motor car, with its ever widening scope and sphere of influence, led to vastly extended tax-free highway improvements financed by the public at low rates of interest and affording speediness, convenience and economies to the shipper and traveller not within the power of the railroad to supply. The highway in its relation to the railroad thus became both a feeder and distributor, and a competitor for traffic. Charges and countercharges of unfairness on one side or the other have followed ever since, emphasized as well by the entry of the air carrier on the scene with its costless channels of movement and its terminals built at public expense.

What was true of highways and airways applied with equal force to waterways with their channels and ports financed in the main from the public purse. The expanding use, too, of pipelines for the conveyance of oil, gasoline and gas, brought to the railroads not only increasing competition but also the loss of shipments of coal thus replaced. The long-distance transmission of electric power also played its

part in the relocation of industries nearer to sources of raw materials and consuming populations, and at points offering competitive freight rates and service. Directly and indirectly transportation in Vermont was affected by these revolutionary conditions, resulting as they did in a redistribution of population and a radical change in its *mores*. In a collective sense transportation more than ever was to have a profound influence on the development of the state.

Railroads

At the opening of the century Vermont's operated railroad mileage totalled some 1100 miles, in contrast with the present 969, a decrease of say 12 per cent in the past forty years. This decrease occurred almost entirely on branches serving rural regions unsupported by factories where the motor car took the place of the railroad.* With the exception of the Boston and Maine's new main line between the Massachusetts border and Brattleboro, largely located in New Hampshire, practically no additions other than quarry and lumbering spurs, yards and sidings were made within the state after about 1900.

Corporate changes, however, were quite numerous. Control of the newly organized Central Vermont Railway Company passed to the Grand Trunk Railway of Canada in 1899 and then to the Canadian National Railways in 1920 when the Grand Trunk was absorbed by that system. The floods of 1927 brought about a new receivership terminated two years later when the Central Vermont Railway Company, Inc. was organized and its control left in the hands of the Canadian National where it is today. In common with all interstate railroads in the country, the Central Vermont like others in Vermont was taken over by the United States government during World War I. With the backing of the Canadian government the Central Vermont was able to survive the financial debacle in the 1930's and maintain its property in good repair. The expansion of its parent road from coast to coast in 1915 brought to Vermont an increased volume of "pass-over" traffic, largely through the Alburgh Junction gateway. It was in 1922 that a formal agreement was made with the Boston and Maine whereby the line between White River Junction and South Vernon is used jointly by the two companies; the bridge over Lake Champlain from West Alburgh to Rouses Point is now owned jointly by the Central Vermont and Rutland companies.

Much more saddening was the career of the Rutland Railroad after 1900. Regaining its independence in 1896 coupled with the control of the Ogdensburgh and Lake Champlain and its Great Lakes fleet in 1899, and extended by purchase in 1901 northerly from Burlington to and beyond the international border and southerly from Bennington to Chatham, it was in a fair way again to play an in-

*See Exhibit A for railroad abandonments since 1900, and page 81 *infra* for quarry and lumbering spurs given up.

dependent part in the carriage of differential through traffic and in the local development of Vermont. Its control, however, passed in 1905 to the New York Central which in 1911 conveyed to the New York, New Haven and Hartford Railroad a half interest in the property. Under the terms of the Panama Canal Act its Rutland Transit Company Great Lakes ships were sold and operations ceased. It was in 1917 that an agreement was made with the Grand Trunk whereby its through passenger trains were given access to Montreal via Rouses Point instead of Noyan Junction. Through the ups and downs of succeeding years the company survived until 1938 when it became bankrupt and narrowly escaped abandonment before the recent flood of war traffic for the time-being saved the day. Low rates on the predominating differential traffic, the absence of a generous parent as enjoyed by the Central Vermont, and sharp competition with motor traffic—all these have combined to bring to grief a railroad indispensable in the public interest, in war and in peace.

More fortunate has been the fate of the Boston and Maine system reorganized in Vermont under the same name in 1919, although even there its course has been far from smooth, especially during the Great Depression when a receivership was narrowly averted. It had the benefit of contributed traffic from the Canadian Pacific, first at Newport, and then at Wells River when its lines north of that point were leased to the latter company in 1926. In the same year the misfortunes of the Montpelier and Wells River and Barre and Chelsea led the Boston and Maine to pass over their management to local interests, as had been the case also with the management of the St. Johnsbury and Lake Champlain in the previous year. Of the Maine Central little is to be said other than that its lease of the Hereford Railway beyond Beecher Falls in Quebec was terminated in 1925 and the line in large part abandoned in 1928. Its Coos Valley and Upper Coos roads were absorbed in 1932, and a lease lasting from 1912 to 1927 was made by it of the St. Johnsbury and Lake Champlain. Thereafter the portion east of St. Johnsbury was taken on as a sub-lease from the Canadian Pacific.

It is to be added that a number of branches built for special purposes have been abandoned since the beginning of the century, such as the Victory spur of the Maine Central in 1917 and the Bethel granite railroad in 1934, the Manchester, Dorset and Granville Railroad in 1918 and the "Deerfield railroad" from Wilmington to Stratton in 1923; the lines from Barre to Williamstown and from Swanton to Maquam have long been out of use. Mention has been made of electric railroad abandonments. They include the first one built in the state from Burlington to Winooski and also those from Castleton to Lake Bomoseen, Montpelier to Barre, Waterbury to Stowe, St. Albans to Swanton and St. Albans Bay, Burlington to Essex Junction, Rutland to Fairhaven, Poultney and Lake Bomoseen and within Rutland, Bennington to North Bennington and Williamstown, Massachusetts, Brattleboro to West Brattleboro, and Bellows Falls to Saxtons River. They

yielded to motor car competition between 1916 and 1925, after a short-lived existence illustrative of tragedies in transportation due to advancement in the art. The one last to go, the Mt. Mansfield Electric Railroad between Stowe and Mt. Mansfield, died of inanition in 1931-33. Mention, too, should be made of the abandonment of passenger traffic on some of the existing steam railroads in and beyond the state, as between St. Albans and Richford, Montpelier and Barre, Rutland and Whitehall, Castleton and points on the Delaware and Hudson in New York, and between North Bennington and Chatham, New York—all the result of motor car competition.

In brief it is to be said that the history of the railroads in Vermont, since the opening of the 20th Century, has continued to reflect little or no comfort to their investors, nor in a large degree to the state's agricultural population. Nevertheless their influence on the industrial growth of the Green Mountain State has been beneficial, as it has been on its public exchequer through state taxation of railroad properties. From the unselfish angle, the state has had grounds for happiness in having its soil used as a thoroughfare for the Canadian systems seeking warm water North Atlantic ports, and for the New England states in general thirsting for alternative differential routes to and from the West—something like a half or more of the state's total railroad traffic is of that order. A reinspection of Figures 10, 11, and 14 will make this clear, as will an examination of Appendix A showing railroad mileages in 1940 and their dates of opening for traffic.

Highways

Unlike the railroads, transportation by highway in the state at the commencement of the 20th Century was still primitive as to its means of propulsion, and not much better off as to the roadways themselves. Domestic animals as of yore did the pulling, the vehicles used had long since reached their apex, and little advance, except in certain places, had been made in maintenance and in improvement of drainage, travelled surfaces and bridging. Then, with startling suddenness, in the closing years of the 19th Century came the motor car soon to revolutionize free-wheel transportation, and with it change the people's way of life. John T. Slack of Springfield is said to have operated a Stanley locomobile in Vermont in 1897, and an automobile equipped with the internal combustion engine is reported to have appeared in the state about 1900.

Emerging in 1759 from a period of savagery lasting for 150 years, it was not until 1779 that legal highways were first recognized in Vermont, and less than twenty years later that the length of public highways in the state, shown in skeleton form on Figure 7, had crept up to some 1100 miles. Turnpiking, to which reference has been made, gave slight relief on the 500 miles so treated, and with the coming of railroads in 1850 the building of highways lapsed until in 1892 a broadened public

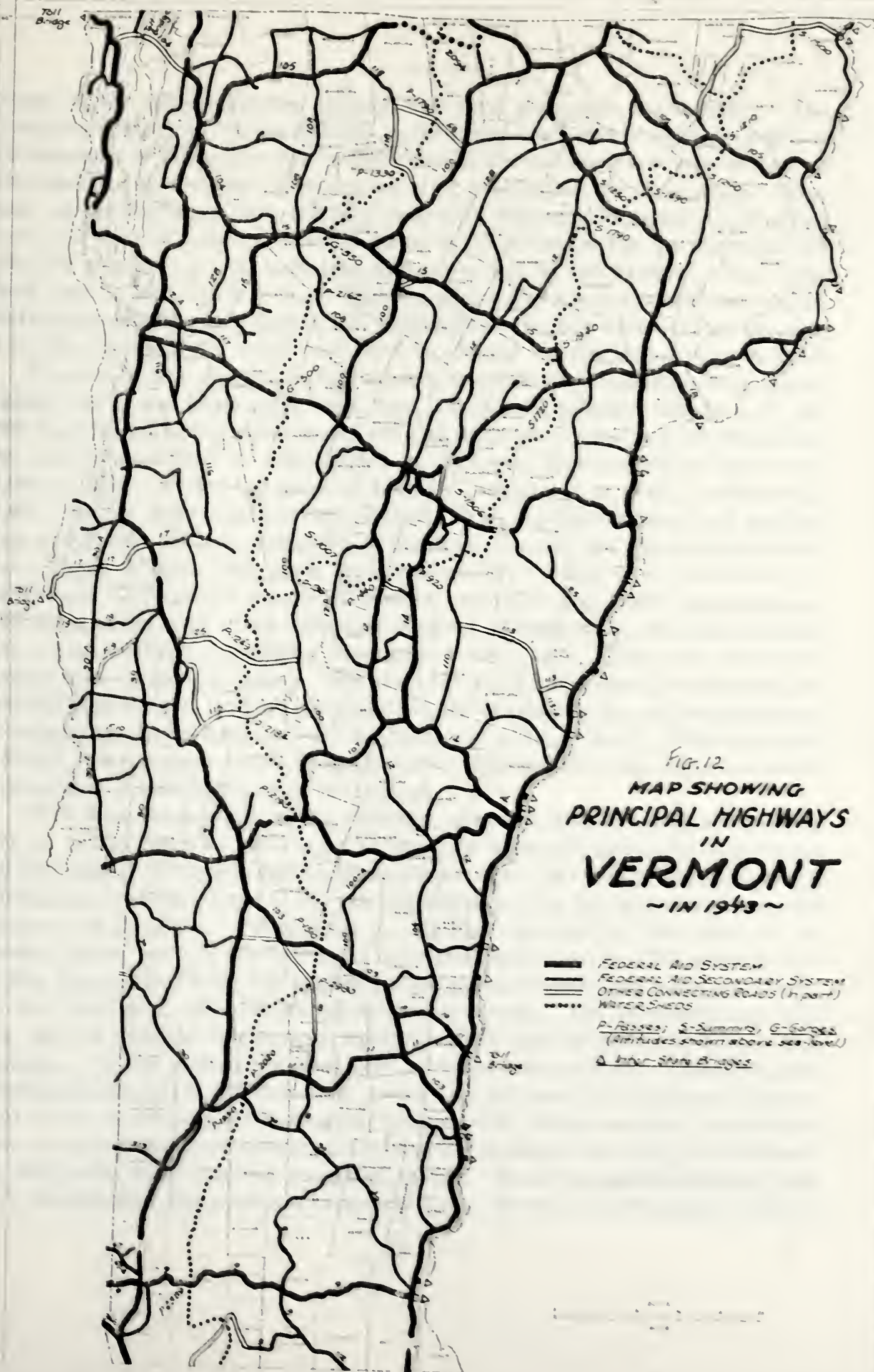


FIG. 12
 MAP SHOWING
 PRINCIPAL HIGHWAYS
 IN
 VERMONT
 ~ IN 1943 ~

— FEDERAL AID SYSTEM
 — FEDERAL AID SECONDARY SYSTEM
 — OTHER CONNECTING ROADS (in part)
 WATER SHEDS
 P-PASSES; S-SUMMIT; G-GORGES
 (Altitudes shown above sea-level)
 Δ HIGHWAY BRIDGES

interest in the subject became aroused, and state assistance was initiated. The principle of State Aid was established in the latter year, and in 1898 the office of Commissioner of Highways was created—just as the automobile is reputed first to have appeared in the state, ninety years after the epochal launching of the “Vermont” at Burlington in 1808, and fifty years after the steam locomotive had puffed its way for the first time up the White River valley in 1848. The end of the age-old primitive transport era on both land and water was at last in sight. It is to be noted that in 1906 the first State Highway Department was established, in 1921 the Highway Board—in furtherance of the enlightened policy that had been prompted by the coming of the motor car—and the Motor Vehicle Department in 1927.

Progress in this departure from ancient methods and customs was of course gradual, but it was much more rapid than it had been on water and by rail. By 1906 there were 373 registered motor vehicles in the state returning \$3,399 in fees. The number had risen to some 30,000 in 1920 and then sharply to more than 90,000 in 1929. Under the stress of wartime restrictions in 1942, it declined to 88,458 vehicles returning, however, \$4,619,173 in registration fees and gasoline taxes which were allotted exclusively to highway purposes and costs of administration. To the amounts thus made available have been added those contributed by the Federal Government since 1917 and in particular since 1922 (amounting in 1939-40 to 14 per cent of the total state highway revenue), and also those derived from town assessments (equalling 3 per cent of the total). There were also minor receipts from incidental sources. For the 1939-40 biennial period the average annual highway revenue from all sources available for construction and maintenance, including unexpended balances from the fiscal year ending June 30, 1938, amounted to \$5,623,542, a remarkable showing when it is realized that in this the state started from scratch at the beginning of the century.

With these moneys the public highways, extended from about 13,000 miles in 1891 to 14,338 miles in 1943, were enormously improved under the supervision and direction of the state's able highway officers. By 1943 nearly 9 per cent of the mileage had been paved and 51 per cent gravelled, leaving but 40 per cent partially improved or primitive. Federal aid in this had extended to 1106 miles of the “State System” serving inter-city and interstate traffic, and to 1355 miles of connecting links in the “State Aid System” carrying inter-county and interstate travel, for the most part, between communities and towns. The accompanying map (Fig. 12) and the data appearing in Appendix B are intended to throw light on this situation. In the process not only were surfaces improved and widened on the principal routes; but in addition many curves were lightened and alignment straightened, gradients reduced, multiple traffic lanes created, bridges adapted to increased sizes of vehicles and heavier loads, railroad grade crossings here and there eliminated, and bottle necks cured in congested regions. Even the casual observer must have realized that this work has been well done. However, 9,194 miles of strictly

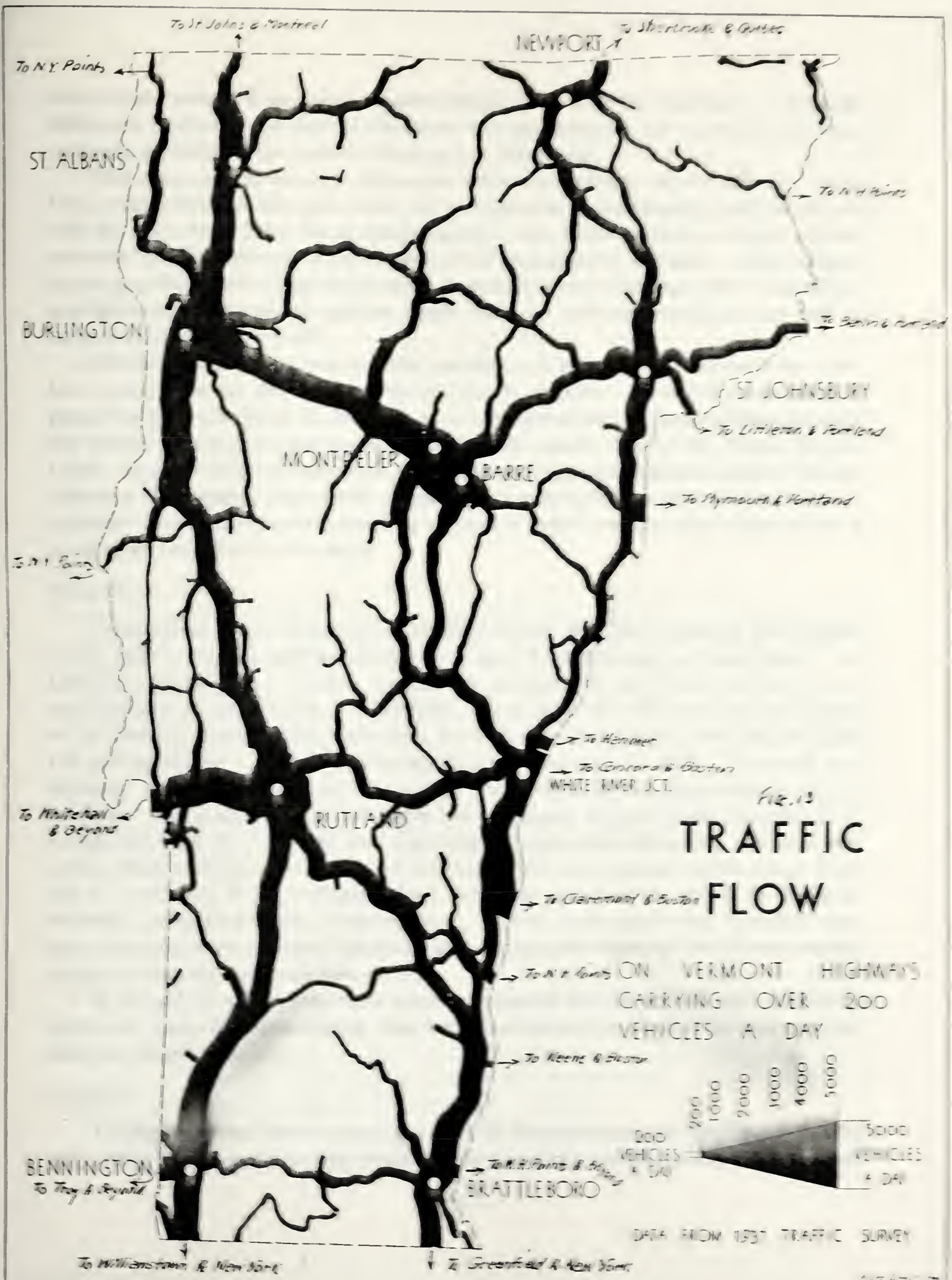
rural highways constitute some 64 per cent of the state's total mileage. Of these, 5,937 miles still require improvement, as do many of the more densely travelled routes still far from perfect.

As has been previously discussed, the highways of Vermont ever have been a public charge insofar as the construction and maintenance of their roadbed and surfaces are concerned, except during the toll-turnpike period in the first half of the 19th Century, when private capital temporarily took some of them over. With respect to the vehicles using them, however—just as much a part of the highways in the fuller sense as are the cars and locomotives on the railroads—ownership with all its burdens has been private. In other words, the matter of investment and management in this case is dual—ownership by the public of the channels of movement, and by private individuals or corporations of the vehicles with which to carry freight and passengers. This is in marked contrast with private ownership of both road and equipment on each of many separately controlled railroads. Ever since the modernization of highway channels of movement, begun shortly after the coming of the motor vehicle at the opening of the century, the railroads in their agony have complained of what they deem to be unfair competition with a tax-free agency, financed from the public purse.

In the early days of the motor vehicle, its purpose was almost exclusively one of individual pleasure and convenience, but gradually the motor truck and bus came into being, especially after 1920. These were owned and operated not only by individuals but also by corporations acting as common carriers, and acting both in competition with the railroads and as feeders and collectors of traffic interchanged with them. On the more important highways the density of traffic grew until of late it has varied from as little as 200 vehicles daily to more than 5000 as indicated on the accompanying map (Fig. 13).

It will be noted that maximum intensities of flow extend along the entire western side of the state on U. S. Route 7; also from Rutland to Fairhaven and easterly from Burlington to Montpelier—as is to be expected where industrial activities abound, where interstate traffic is of great moment, and where the spacious hinterland is rich in agricultural products. Next in importance is U. S. Route 5 from one end to the other of the eastern side of the state. The flow here is particularly great in the neighborhood of industrial centers and where traffic in large volume flows to and from New Hampshire, Massachusetts and Canada. Cross-state important thoroughfares include those from Rutland to Bellows Falls and White River Junction, and from Montpelier in two directions to St. Johnsbury and White River Junction.

It will be remarked that the highways, like the railroads, are used extensively for pass-over traffic originating in and destined for points outside the state. In fact the records show that this tendency has been constantly increasing until now, during the summer season, nearly 45 per cent of the average total traffic is of the



out-of-state order—a proportion quite similar to that of the railroads. The only difference is that in the case of the latter the exchange for the most part is international, whereas in the former instance it is interstate.

Summing up, Vermont's highways, since the opening of the century, have been completely transformed both as to channels of movement, and as to the vehicles they carry, the one a public agency, the other privately owned. From servants of the railroads they have become competitors as well. Their importance as links in interstate commerce has mounted with the years from something negligible to a point which signifies much from the national standpoint as well as from that of the state itself.

All this has brought troublesome problems, of which one is the need for relief from congestion on the main north and south arteries. Its solution, at least in part, has been proposed in the form of a new central-state thoroughfare through the retired sparsely settled region bordering the eastern foot of the Green Mountains. In its future consideration the state no doubt will balance against its advantages the injuries that would result from a constant procession of commercial vehicles—trucks and buses—speeding through a quiet country than which there is none more beautiful in the world.

Waterways

Connecticut River traffic having reached its end with the coming of the railroad in the 1850's, there is nothing further to record of happenings on water there. On Lake Champlain there is today continuous transport of petroleum products, coal and fertilizer to local points. In addition, movements of a minor nature incidental to the summer tourist traffic took place from the beginning of the new century until the ending of the Champlain Transportation Company in 1933. Railroad and highway competition had put the state's waterways, in the larger sense, out of business. Ferry service here and there has continued, as have some movements in connection with the Chambly and Champlain canals, and otherwise. Dreams still persist that provision will be made eventually for ocean going vessels to go from the St. Lawrence River through Lake Champlain and over the divide to the head of ocean navigation in the Hudson River. It has been urged that Vermont thus may be saved from continued isolation in a world-wide sense and its shores thereby made inviting for heavy industry.

It should be added that such minor navigation as had existed since the early 1800's on Lake Memphremagog, has been represented in these later years by at least one small steamer.

Airways

Flying machines first entered the field of transportation in the United States very early in the century, but their full development for peacetime purposes has

come much more slowly than advances in the art of movement on land and water. The first flight in the state is reported to have occurred at St. Johnsbury on September 24, 1910, at the hands of Charles F. Willard, and the building of the first air field by Governor-to-be James Hartness at Springfield in the year 1919 or thereabouts. It is pleasant to relate that Charles A. Lindbergh landed at Hartness field in 1927, six years after the Cleveland Air Service was established in the state, and one year before the latter's successor came into being, the Vermont Airways Corporation then furnishing the state's only commercial operation. Out of fifteen airports approved for commercial flying in Vermont only eight now survive; and but one common carrier airline, the Canadian Colonial, remains in service, operating between Boston and Montreal via Barre-Montpelier and Burlington.

It is curious to record such backwardness in the spread of the latest form of transportation in Vermont. Again the state is outstanding in the devotion of its domain to "bridge traffic." Perhaps the anticipated coming of the helicopter and glider-plane, without their need for extensive runways and airports, will in time give to the Green Mountain State an opportunity to enjoy air travel to the full.

Pipelines

Across the northeastern corner of Vermont runs the only pipeline in the state for use in regular transportation. It was constructed in 1941, in the interest of the Portland Pipe Line Company (a subsidiary of the Standard Oil Company of New Jersey), for the conveyance of crude oil from Portland, Maine to Montreal. Its reported primary purpose is the elimination of the long tanker haul by way of the North Atlantic Ocean and St. Lawrence River. Its total length between termini is 236 miles and its diameter 12 inches, affording a minimum capacity of 30,000 and a maximum of 60,000 barrels daily, depending on the type of oil to be transported. Vermont itself gains nothing from this latest addition to its means of movement, other than through the taxation of its property and the knowledge that the facilities thus furnished may serve the nation.

Summary

The present century, it will have been observed, has witnessed tremendous changes in which Vermont has been in the forefront in many ways. Its railroads, it is true, have been practically stationary in mileage, or indeed have fallen back in that respect; and in their general condition they have suffered from inadequacy and obsolescence brought on by the Great Depression. Their private investors have been the losers, which promises ill for the future raising of capital from that source for necessary modernization after peace comes.

The real revolution so far lies in the field of highway transportation, marked as it has been by the entry of the internal combustion engine and by improvement

of channels of movement at public expense, for serving the new kind of motive power. With this has come a change, equally dramatic, in people's places of abode and ways of living and observation of the verities as well as in the interrelation and interdependence of water, rail and highway carriers serving a common purpose. Co-ordination of the nation's carriers one and all during the present war has proved to be of immeasurable benefit, and may be looked for as one way out of the difficulties to be faced hereafter, especially in view of the expected future expansion of airborne transportation.

Bibliographical References: Nos. 5, 9, 13, 15, 21, 25, 27, 31, 39, 40, 42, 44, 45, 46, 52, 53, 55, 56, 60, 74-79, 88, 91, 101, 103.

X

RESUME

LOOKING backward in the light of history it is not difficult to trace the part played by transportation in the evolution of Vermont. A rough-hewn land of narrow valleys and little rivers shut in by mountain ranges, poor in raw materials, and without direct access to the outside world by sea, it nevertheless found merit in the eyes of man. For a century and a half after 1609 its soil was coveted and fought for by rival white and Indian claimants as a pathway between Canada and New England. For another fifty years it was first a scene of civil discord and battles for independence and then of peaceful growth in lumbering and farming when the arrival of the steamboat in 1809 gave warning of the coming of a revolution in means of transport, from primitive to steam propulsion. Meantime its rich forests had been cleared enough to enable the swiftly increasing population to establish self-sufficient homes and provide grazing lands for sheep in growing numbers on its hillsides for another forty years. By the middle of the 19th Century, the hitherto marked increase in population showed signs of letting up. Primitive means of transport, other than on water, still persisted.

External as well as internal influences, however, were pointing to a further departure from age-old crude means of movement. New England, situated disadvantageously at the eastern extremity of the nation, aspired to contact with the Mississippi Valley and Great Lakes Basin other than by the Erie Canal, busy feeding western products into thriving New York City. The outstanding topic of the times was transportation. Vermont in that crucial moment again was seen as a pathway, as in early days, whereby the seaports of Boston and Portland and their hinterlands might reach westward through Canada by means of the steam railroad then newly introduced. The Green Mountain State by nature held a place of great strategic import; it was the keystone in a northern arch of communication around the Adirondacks standing at the portal to the West. On top of this the state internally was hungering for means whereby its mineral resources of granite, marble and slate, until then fallow, might be moved with profit to distant markets. Similarly, its dairy products—in substitution for wool and mutton—sought outlets to consuming centers in New England and New York. Western competition and the lowering of tariff protection were threatening the state's sheep industry with extinction, and the lure of factories in neighboring states and better opportunities in the West, were robbing it of its youth. Its forests, too, were fast disappearing and

something had to be done to bring in logs and timber from afar to keep its lumber industry going.

The time, therefore, was ripe in 1848-49 for the coming of railroads in Vermont, spreading east and west and north and south for another fifty years until their maturity was reached as the 19th Century came to a close. Highways utilized by means of animals were the railroad's feeders and distributors, as they had been for the waterways before the latter folded up in the face of rail competition. The railroads well served their purpose as a link in New England's independent connection with Canada and the West, and as an outlet for Vermont's products including its budding industries; but they brought sad disappointment to their investors and failed to check stagnation in the state as measured by size of population. Farming in narrow valleys on a rough terrain unadapted to the use of labor saving machinery had dwindled, and the less fertile hillsides had lost their people to prospering villages and cities fostered by railroads and better highways. Vermont could take comfort from having been an aid to its sister states in furnishing pathways for badly needed inter-regional differential routes; it could take none from the flight of its youth to more promising states. Something else would have to be done to save the day.

At this point, with the opening of the 20th Century, came two more steps in the revolution from primitive to power transportation—the conversion of the highway from a railroad tributary to a competitor as well, by means of the entry of the motor car powered by the internal combustion engine; and the conquest of the air by means of the Wright Brothers' aeroplane. Even more than the railroads, these advances in the art of transportation since the beginning of the century were to lead in the promotion of momentous changes in Vermont's ways of living, but not to a degree sufficient to rescue the state from standing still. Strive as they might they have been unable to overcome the state's handicaps.

Evidences of this failure are not far to seek. Railroads serving rural regions only, have been abandoned one by one, although those handling inter-regional traffic have so far weathered the storm and have been improved somewhat as to design of equipment and quality of track. All, however, have had disastrous outcomes for their private owners. Highways have been greatly improved for both interstate and local traffic, the roads themselves from the public purse and the motor vehicles rolling over them at private expense; but they have done little locally to lift the state from the slough of despond. Air service, in part financed by the public, has been slow to play much part in Vermont; its effect on the state's wellbeing lies ahead. The pipeline across the state's northeastern corner so far devoted exclusively to international interests, too, has a fate not yet to be foretold. All five types of transportation serving a common public purpose are closely interrelated, though separately controlled and financed in a variety of ways. In the present stress of war they are administered as a whole under the direction of a

representative of the Federal Government. Whether or not this will so continue, after the war, is as yet unknown.

One asset of the Green Mountain State remains for mention—its peerless charm and beauty. Availled of so far, in the main, by people from the outside in search of recreation and temporary retirement from the trials of city life, the benefits thus brought to the citizens of the state have been comparatively slight. May it not be that Vermont still will awaken to the rare possibility of reaping a rich harvest—material and spiritual—from a possession so unique? It has been said that it lies not within the province of the recorder of the past to speculate on the future. Shakespeare, however, thought otherwise in saying:

Sure, He, that made us with such large discourse,
Looking before and after, gave us not
That capability and godlike reason
To fust [moulder] in us unus'd.

Fortified by this admonition, the hope is here expressed that the state will take measures to protect its beauty by restraining the woodman's axe in its mountain forests and by saving the shores of its lovely little rivers and lakes from desecration; furthermore that the beauty and usefulness of its lofty outlooks on distant scenes will be enhanced by the encouragement of year-'round cultural, recreational and educational centers akin to those of ancient Rome and Greece. It is easy to foresee their uplifting effect on the spirits of Vermont's young people and a possible reversal of their tendency to leave the land of their fathers.

This writer ventures to express the belief, or perhaps hope, that the cultivation of its one outstanding asset in some such manner, and improvements in the one field of transportation still offering notable prospects of great advancement—the airway—will in the future make of Vermont a dynamic state, at least in the higher sense, instead of a continuing static one. Perhaps the helicopter will make this possible.

There is one other direction in which the eyes of Vermont may look for rescue, and that is the adaptation of Lake Champlain to ocean vessel navigation as has been proposed. In that case, however, it should be realized that the state's priceless heritage of beauty there may be threatened, unless the blighting effects of commerce and industry can be prevented by the taking of suitable precautions.

In conclusion let it be noted that transportation in Vermont for three-and-a-third centuries, in all its forms from primitive to modern, has had a tremendous part for good or evil in making the state what it is today. It remains for its citizens, in the cultivation of its beauty, to take full advantage of what lies ahead in the field of human endeavor on which all else depends—the coordinated movement of man and his products, by modern means, from place to place, with a minimum of cost and effort.

CHICAGO, ILLINOIS

1900

APPENDICES

A. RAILROADS OF VERMONT IN 1940

<i>STEAM RAILROADS</i>	<i>Mileages of Road</i>			<i>Opened</i>
	<i>In Vt.</i>	<i>Outside</i>	<i>Total</i>	
Barre and Chelsea R. R. Co.—Barre to E. Barre	19.6	—	19.6	1888-1892
Boston & Maine R. R. Co.				
B. & M. R. R.—Mass. State Line to Brattleboro. (0)	0.7	8.9	9.6	1913
C. V. R. R.—Mass. State Line to Brattleboro. (T. R.)	10.6	—	10.6	1849
Vt. Valley R. R.—Brattleboro to Bellows Falls. (L)	24.7	—	24.7	1851
Rutland R. R.—Conn. Riv. bridge to Bellows Falls. (T. R.)	0.4 [±]	—	0.4 [±]	—
Sullivan Co. R. R.—Bellows Falls to Windsor. (L)	—	24.3	24.3	1849
C. V. R. R.—Windsor to White River Jct. (T. R. 12.9, L. 0.7)	13.6	—	13.6	1849
Conn. & Passumpsic Rivers R. R.—White River Jct. to Wells River. (L)	40.6	—	40.6	1848
Fitchburg R. R. (Southern Vt. R. R.) in town of Pownal. (0)	6.1	—	6.1	1859
Fitchburg R. R. (Boston, Hoosac Tunnel & Western R. R.) —in town of Pownal (o)	6.5	—	6.5	1879
Connecting track—At Wells River, etc. (L)	0.3 [±]	—	0.3 [±]	—
Total	103.5	33.2	136.7	
Bristol R. R. Co.—New Haven Jc. to Bristol. (Abandoned in 1930, 6.1 miles)	—	—	—	1892
Canadian National Ry.				
Grand Trunk Ry. of Canada—N. H. State Line to Canadian Line via Island Pond. (0)	30.6	—	30.6	1853
Vt. & Province Line R. R.—Alburgh Jc. to Canadian Line. (0)	3.1	—	3.1	1879
Total	33.7	—	33.7	
Central Vermont Ry. Inc. (Controlled by C. N. Ry.)				
Montreal & Vermont Jct. Ry.—St. Johns, Que. to Canadian Line. (0)	—	25.3	25.3	1864-65
C. V. Ry.—Canadian Line to Windsor, Vt. (0)	147.8	—	147.8	1848-1864
B. & M. R. R.—Windsor to Brattleboro. (T. R.)	23.7	24.3	48.0	1849
New London Northern R. R.—Brattleboro to New London, Ct. (L)	10.5	114.7	125.2	1849-1867
B. & M. R. R.—Mass. State Line to Brattleboro. (T. R.)	1.7	8.9	10.6	1913
C. V. Ry.—St. Albans to Rouses Point, N. Y. (0)	20.7	0.8	21.5	1851
C. N. Ry.—At Rouses Point, N. Y. (L)	—	0.4	0.4	—
C. V. Ry.—St. Albans to Richford. (0)	27.4	—	27.4	1873
C. V. Ry.—Burlington to Essex Jc. (0) (Branch to Cambridge Jc. abandoned in 1938, 25.8 miles)	7.8 [±]	—	7.8 [±]	1849-1877
C. V. Ry.—Montpelier Jc. to Barre (0)	8.1	—	8.1	
N. Y. N. H. & H. R. R.—At Willimantic, Ct. (T. R.)	—	0.1	0.1	—
Total	247.7	174.5	422.2	
Canadian Pacific Ry. Co.				
Newport & Richford R. R.—Canadian Line to Newport, leased to Montreal & Atlantic Ry. operated by C. P. Ry.	21.5	10.6	32.1	1873-75
Midland Ry. of Vt.—Canadian Line to North Troy. (L) (Abandoned in 1936, 1 mile)	—	—	—	1911
Connecticut & Passumpsic Rivers R. R.—Canadian Line to Wells River (L)	69.0	—	69.0	1850-1867
Total	90.5	10.6	101.1	

Clarendon & Pittsford R. R. Co.				
C. & P. R. R.—W. Rutland to Hollister & branches. (0)	17.7	—	17.7	1885-1887-1902
D. & H. Co.—W. Rutland to True Blue. (T. R.)	2.0 [‡]	—	2.0 [‡]	
Total	19.7	—	19.7	
Delaware & Hudson R. R. Corp.				
Rutland & Whitehall R. R.—N. Y. State Line to Castleton. (L)	6.8	—	6.8	1850
Rensselaer & Saratoga R. R.—N. Y. State Line to Rutland. (L)	29.9	—	29.9	1851
Rutland R. R.—At Rutland. (T. R.)	0.4	—	0.4	—
Total	37.1	—	37.1	
Hardwick & Woodbury R. R. Co.—Granite Jc. on St. J. & L. C. R. R. to Woodbury. (Abandoned in 1934, 10.5 miles)				
	—	—	—	—
Hoosac Tunnel & Wilmington R. R. Co.—Hoosac Tunnel to Readsboro. (0) (Readsboro to Wilmington abandoned in 1937, 13 miles)				
	2.8	8.1	10.9	1885
Maine Central R. R. Co.				
Me. C. R. R.—Quebec Jc., N. H. to Beecher Falls, Vt., portion in N. H.	—	41.5	41.5	1887-91
Me. C. R. R.—N. H. State Line via Guildhall to N. H. State Line. (0)	12.3	—	12.3	1891
Me. C. R. R.—N. H. State Line to Beecher Falls. (0)	1.5	—	1.5	1889
St. J. & L. C. R. R.—Lunenburg to St. Johnsbury. (L)	22.1	—	22.1	1872-77
St. J. & L. C. R. R.—At St. Johnsbury. (T. R.)	0.1	—	0.1	—
Total	36.0	41.5	77.5	
Montpelier & Wells River R. R. Co.				
M. & W. R. R. R.—Montpelier to Wells River (0)	38.0	—	38.0	1873
M. & W. R. R. R. Montpelier to Barre. (0)	3.8	—	3.8	—
Barre & Chelsea R. R.—At Barre. (L)	1.7	—	1.7	—
Total	43.5	—	43.5	—
Rutland Railroad Co.				
White Creek to Canadian Line. (0)	158.4	—	158.4	1853
White Creek to N. Bennington				1852
Bennington to Rutland				1849
Rutland to Burlington				1900
Burlington to Canadian Line	52.2	—	52.2	1849
Bellows Falls to Rutland. (0)				1917
Alburgh to N. Y. State Line. (0)	2.8	—	2.8	—
Chatham, N. Y. to N. Y. State Line. (0)	—	51.3	51.3	—
N. Y. State Line to Bennington. (0)	10.6	—	10.6	—
N. Y. State Line to Ogdensburg, N. Y. (0)	—	117.6	117.6	1850
Addison R. R.—Leicester Jc. to Larrabee's Point. (Abandoned thence to Addison Jc. in 1920). (L)	13.5	—	13.5	1871
Rutland & Noyan Ry.—Non-used, 3.4 miles. (In Que.)	—	—	—	1900 [‡]
Miscellaneous, including N. Bennington Conn. & Burlington Union Sta. 0.5 (0) and C. V. track at Burlington 0.4 (T.R.)	0.9	—	0.9	—
Total	238.4	168.9	407.3	
St. Johnsbury & Lake Champlain R. R. Co.—St. Johnsbury to Swanton. (0)				
	96.2	—	96.2	1873-1880

West River R. R. Co.—Brattleboro to South Londonderry. (Abandoned in 1938, 35.5 miles)	—	—	—	1880
White River R. R. Co.—Bethel to Rochester. (Abandoned in 1933, 19.3 miles)	—	—	—	1898-1900
Woodstock R. R. Co.—White River Jc. to Woodstock. (Aban- doned in 1933, 13.9 miles)	—	—	—	1875
Grand Total—Miles Operated (Including duplications in cases of joint use)	968.7*			

ELECTRIC RAILROADS

Mt. Mansfield Electric R. R. Co.—Stowe to Mt. Mansfield. (Abandoned in 1931-33)	—	—	—	—
Springfield Terminal Ry. Co.—Springfield, Vt. to N. H. State Line	4.3	—	4.3	1896

*Miles of Road *Owned* Dec. 31, 1941=919 (I.C.C. Statistics of Railways, 1941) the difference between owned and operated mileages is accounted for by the duplication in the latter owing to trackage, etc.

O=Owned L=Leased T. R.=Trackage Rights
Bib. Ref. 15, 42, 45, 53, 60, 68, 88, 91, 101, etc.

B. ROAD MILEAGES IN VERMONT

January 1, 1943

System	Paved				Gravel			Partially Imp'd & Primitive	Grand Total
	Concrete ¹	Macadam ²	Bit. Mix	Total	Surfaces ³ Treated	Un- treated	Total		
State System ⁴	307.9	218.7	456.6	983.2	339.9	458.1	798.0	0	1781.2
State Aid ⁵	82.2	58.2	64.1	204.5	318.9	2100.4	2419.3	115.4	2739.2
Town.....	26.9	23.7	21.5	72.1	234.8	3780.2	4015.0	5629.9	9717.0
Total.....	417.0	300.6	542.2	1259.8	893.6	6338.7	7232.3	5745.3	14,237.4
Federal Aid (1105.9 miles included above in State System).....	(363.7)	(183.3)	(319.6)	(866.6)	(193.9)	(43.0)	(236.9)	(2.4)	.
Federal Aid Secondary (1355.4 miles in- cluded above State and State Aid Systems).....	(8.0)	(52.8)	(172.2)	(233.0)	(260.5)	(857.7)	(1118.2)	(4.2)	
Toll Roads ⁷	0.2	0	0.9	1.1	0.8	4.9	5.7	0	6.8
Nat'l. Forest Highway ⁸	0	0	0	0	0	13.3	13.3	0	13.3
Federal Development Roads.....	0	0	0	0	0	0.8	0.8	0	0.8
Military Reserve, Jan. 1, 1941.....	0	0	0	0	1.9	1.7	3.6	4.6	8.2
State Forest Roads.....	0	2.6	0.5	3.1	4.7	59.6	64.3	3.7	71.1
Grand Total.....	417.2	303.2	543.6	1264.0	901.0	6419.0	7320.0	5753.6	14,337.6
Percentages — %.....	2.9	2.1	3.8	8.8	6.3	44.8	51.1	40.1	100.0

¹Includes Federal Aid trunk lines primarily serving inter-city and interstate traffic, 1105.9 miles; and on-Federal Aid secondary routes between smaller communities and serving less important inter-city and interstate traffic, 675.3 miles of which 616.9 miles are included in the Federal Aid Secondary System (1355.4), the remainder being non-Federal Aid State System.

²Includes remainder of State-aid highways (733.3) forming a secondary or feeder system of 1355.4 miles serving mainly local traffic between communities and towns but also carrying some inter-county and interstate travel, to which Federal-aid is extended on some connecting links.

³Includes brick, block and bituminous surface or concrete.

⁴Includes rock asphalt surface.

⁵Includes soil cement surface.

⁶Comprises graded and drained, unimproved and primitive roads.

⁷Missisquoi, Rouses Point and Chimney Point State bridges, Mt. Mansfield private road, and Isle La Motte town toll road.

⁸Mt. Tabor to Landgrove.

From information furnished by Hubert E. Sargent, Commissioner of Highways, June 21 and December 7, 1943.

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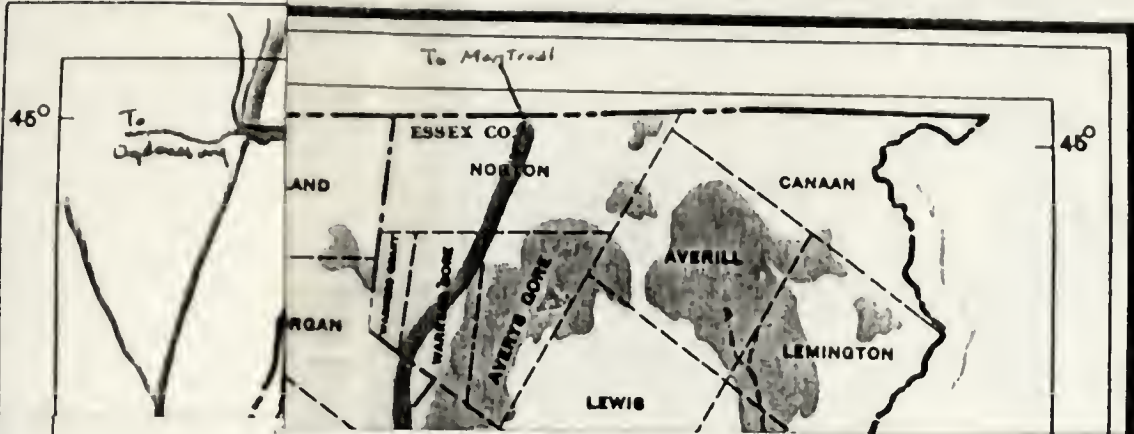
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Railroad

Railway

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River Railroad

Railroad



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Map of RAILROADS in Vermont

Compiled for the
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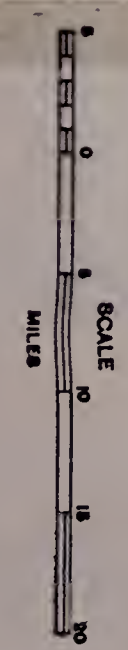
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Major lines — Minor lines —
Discontinued lines - - - -

Central Vermont Railway & Canadian National Railway
Rutland Railroad
Boston & Maine Railroad
Canadian Pacific Railway
Maine Central—St. Johnsbury & Lake Champlain Railroad
Montpelier & Wells River Railroad
Delaware & Hudson Railroad
Other lines





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